WESTERN GAS

April 1932

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ROBERTSHAW

"AutomatiCook"

THIS year, more than ever, you must show your customers that they are getting extra value for their money. Consistent Robertshaw advertising over a period of years has told the women of America that the Robertshaw is vital to good cooking. More than a million and a half Robertshaw equipped ranges have proved it.

Now that the new Model "F" Robertshaw AutomatiCook is being used on so many of the modern low oven ranges, your display of Robertshaw fitted ranges becomes more important than ever.

As easy to set as a radio dial, the Model "F" Robershaw is as handy as it is inconspicuous. And it renders the same precise, accurate and ever-easy oven control that has made the Model "K" Robertshaw so famous on console ranges.

You will want to give your appliance department the full benefit of the Robertshaw influence in creating new range sales and better gas cooking this season. Remember that Robertshaw means quality-acceptance wherever gas ranges are sold . . . and this is always more important than price.

Just drop us a letter and let us tell you how much the Robertshaw is helping the work of the foremost gas appliance departments all over the country.

Robertshaw Thermostat Co.

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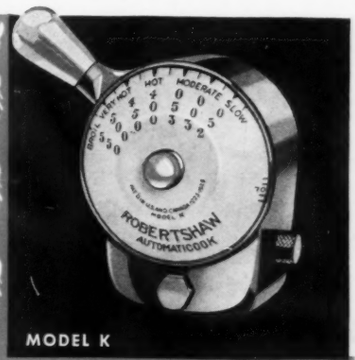

MODEL K

The major essential for correct OVEN PERFORMANCE

MODEL F

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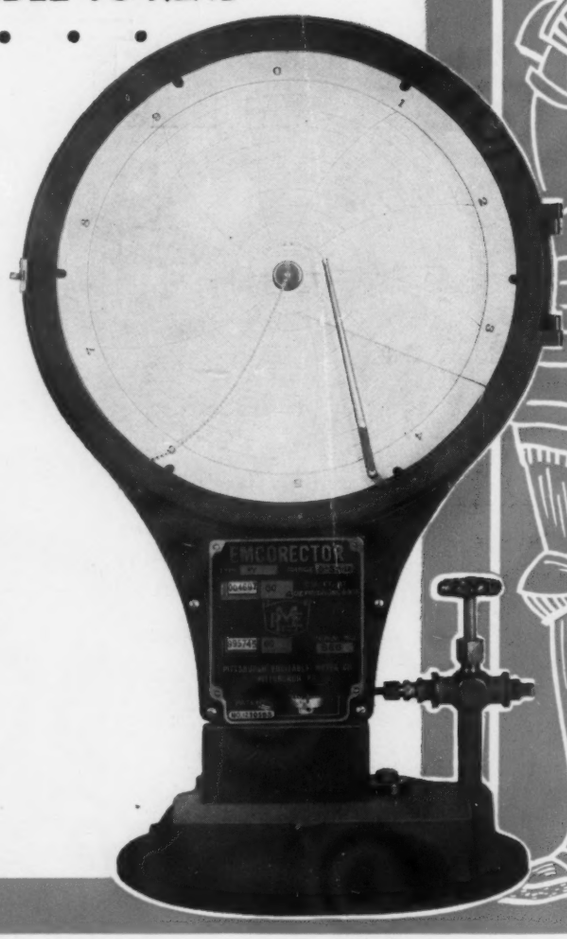
BETTER PUBLIC RELATIONS REQUIRE THAT THE CUSTOMER BE ABLE TO READ HIS OWN METER . . . . .

He can if you have modernized your positive meters and made them DIRECT READING with the EMCORECTOR.

Since the pressure correction is made automatically on small increments, an accuracy can be obtained which is not possible under the chart observation method of correction. Not only do you save time and expense in computing charts, but you also eliminate the chance for error. At the same time the customer has a daily check for his cost records which increases your customer good will.



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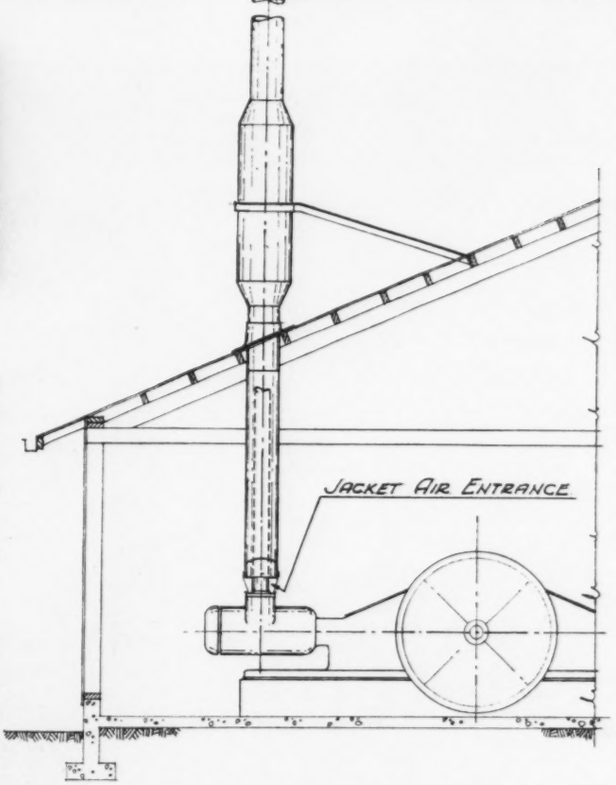
New Muffler Efficiency

Perfected by FLUOR



Gas engine manufacturers announce a new construction feature—exhaust connections on top of cylinders. FLUOR engineers anticipated the result of this modern improvement. Consequently they now present the new overhead, air-cooled muffler.

This advanced muffler utilizes the same principle as other Fluor mufflers but installation is easier. Requiring no additional ground space, it simplifies plant layout.

Air is pulled into this muffler's jacket from around the exhaust connection on the cylinder, thus assuring positive removal of heat from this point. For cold climates, arrangement is such that air supply may be secured through closed duct from outside; this elimates loss of heated air.

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OVERHEAD, AIR-COOLED MUFFLERS

April, 1932, Volume VIII, Number 4, Western Gas is published by Western Business Papers, Inc., at 124 West Fourth Street, Los Angeles, California. Subscription price (in advance) 20 cents the copy; $2.00 per year; 2 years, $3.00; $3.00 per year foreign. Entered as second class matter June 1, 1925, at the postoffice at Los Angeles, under the Act of March 3, 1879.

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AUTOMATIC STORAGE GAS WATER HEATER

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Meeting the demand of today's market in efficiency, reliability, appearance, and price range. Furnished in either galvanized or Everdur tanks, heavily insulated with rock wool. Distinctive control features patterned after those used so successfully for years on Ideal Gas Boilers. Adjustable Snap Action Thermostat, vapor tension thermostatic pilot and quick hand shut-off, all located in one valve. Specially designed flue ways provide rapid and maximum transfer of heat to water. Built-in draft diverter. Write today for complete details.

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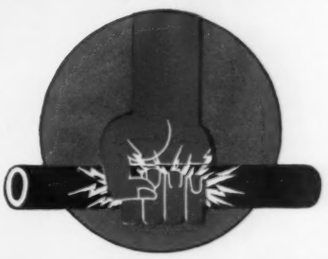

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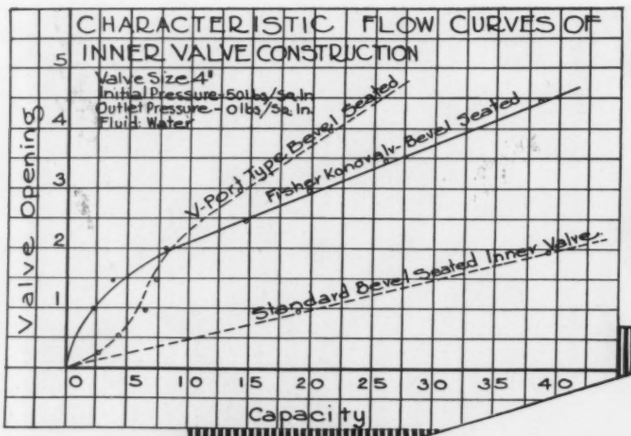

The REPORT on KONOVALV

FISHER GOVERNOR COMPANY
Inter-Office Correspondence

FORM 148

Date March 16, 1932

Mailed From

Subject Report on Konovalv

To Mr. J. H. Fisher, Pres.

Dear Mr. Fisher:

I am pleased to advise that the complete design and capacity work has been completed on our new inner valve, the Konovalv, which gives us, in actual test, the ideal flow curve.

You will recall the engineering department gave us a flow curve and stated that all sizes of Konovalvs must produce that curve in test. This has involved eighteen months of intensive work because each size valve had to be individually designed. A common curvature for the Kono part of the valve in different sizes did not result in the ideal flow curve for all sizes, consequently each size valve has a different curvature.

The factory has a new line of reversible bodies in which to use the Konovalv and we are now in a position to give our customers the most modern throttling flow valve in a superior reversible valve body.

Very truly yours,

FISHER GOVERNOR COMPANY.

Chief of Research Department.

Ask for Bulletin 830

Fisher Governor Company

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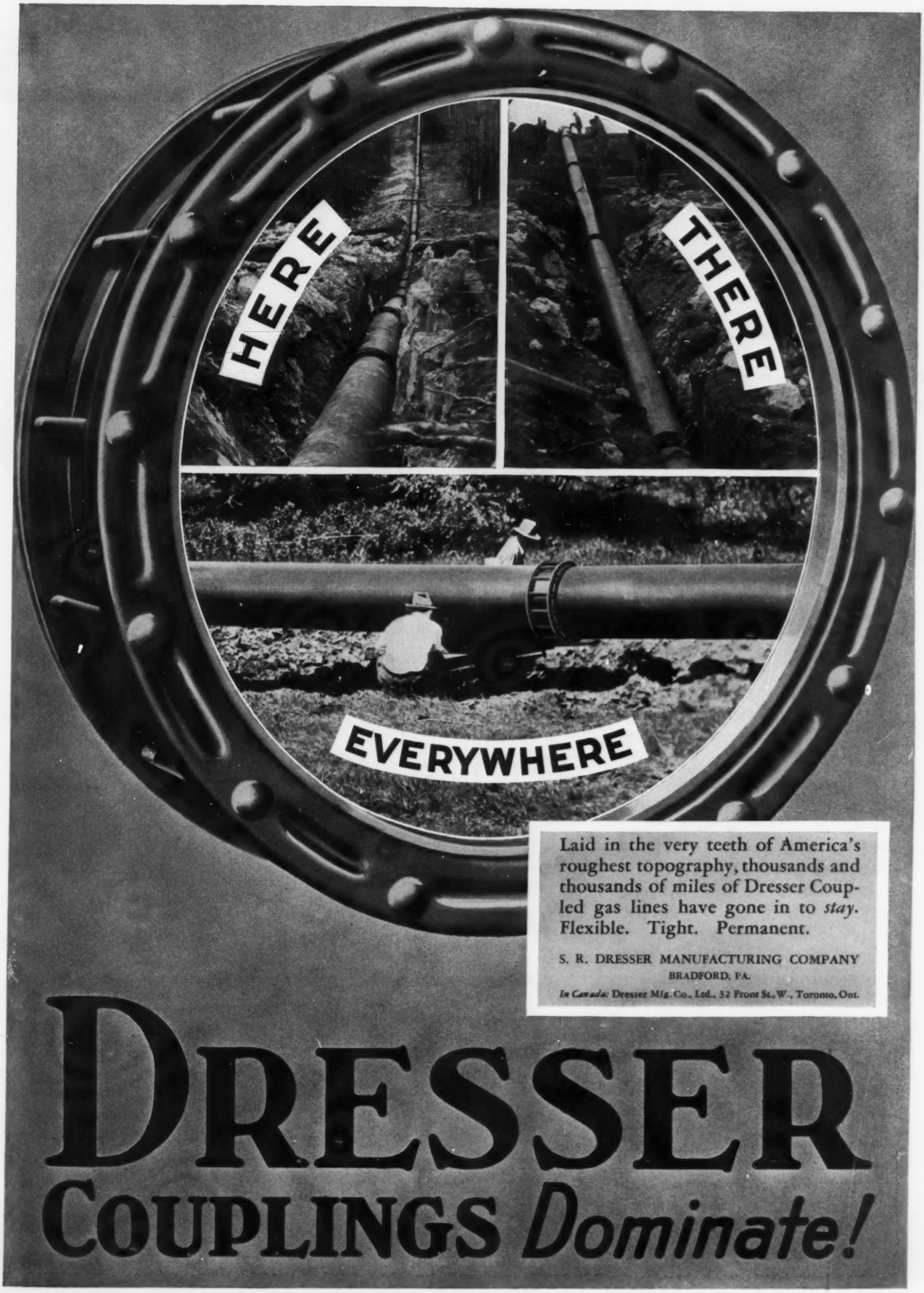
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Laid in the very teeth of America's roughest topography, thousands and thousands of miles of Dresser Coupled gas lines have gone in to *stay*. Flexible. Tight. Permanent.
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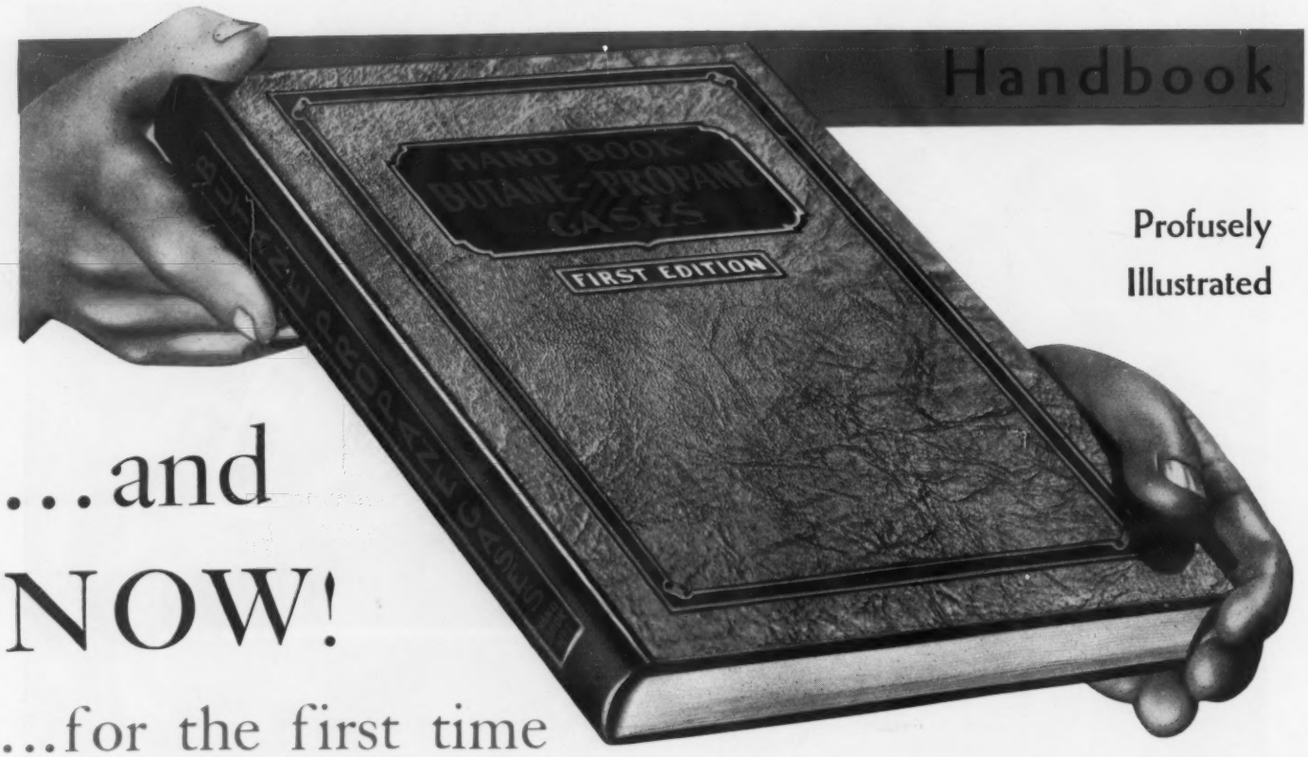

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A Complete Reference Work on BUTANE PROPANE GASES

THIS Handbook comes in response to a very definite need. A tremendous amount of development work has been accomplished for the liquefied petroleum gas industry in a brief space of time, with many companies participating. And to date there has been no one source to which the industry could go for information on all phases of the field. This is the mission of the *Handbook of Butane-Propane Gases*—consolidating and organizing all of these reference data under one cover.

Through the regular publication of "Butane-Propane News," a monthly feature of WESTERN GAS, the editors have established close contact with all branches of the liquefied gas industry—production, bottled gas and town plant distribution, gas enrichment—and to assure a high standard of technical excellence for the Handbook leading figures in the industry have extended their cooperation as contributors.

On the opposite page contents of the *Handbook of Butane-Propane Gases* are reviewed. No phase of the field is neglected, and every major subject heading is treated in detail, making the Handbook an outstanding reference work. Numerous tables, charts and illustrations add to its value.

Advance orders for the Handbook have poured in from all sections of the United States, and from several foreign countries, since the first announcement of its compilation —indicating again the need for this publication and the growing interest in butane-propane service. A limited printing makes it imperative that you place your order now (send no money). Use the coupon on the opposite page.

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(a) History: Highlights in development of bottled gas, central plant, industrial, and enrichment usage.

(b) Present and Potential Scope of the Industry: Statistics on marketed production; available supply; number of central plants, bottled gas distributors, producers; number of gas companies enriching; future field of expansion for bottled gas and central plant service, as well as other forms of liquid gas utilization.

PHYSICAL PROPERTIES:

Vapor pressure curves and tables; tables of constants for hydro-carbon series; proportioning curves, etc. A section made up of basic reference data, with liberal use of curves and charts.

PRODUCTION OF LIQUEFIED PETROLEUM GASES:

Sources for liquefied petroleum gases; the natural gasoline extraction process; refinery gases; dehydration; mixes for gas enrichment, industrial plants, bottled gas, and town plant use under various temperature conditions.

SAFETY REQUIREMENTS:

Presenting in convenient reference form pertinent regulations of the Bureau of Explosives, Underwriters' Laboratories, Compressed Gas Manufacturers Association, National Fire Protection Association; approved field practices for handling, storage, etc.; design of containers.

TRANSPORTATION:

By tank car, motor truck, pipe line, water; design of transportation equipment; traffic requirements; freight charges.

APPLIANCE UTILIZATION:

Appliance design and adjustment for operation on liquefied petroleum gases; combustion characteristics; fuel consumption of various types of appliances; appliance efficiencies on butane-propane, compared to other types of gas.

USE IN GAS MANUFACTURE:

Calculations in connection with use of propane and butane with manufactured gases; enrichment of manufactured gas transmitted under high pressure; use of propane and butane to meet peak loads; use of propane and butane as a substitute for gas oil for the carburetion of blue water gas; use of butane or propane for heating gas underfired coke ovens to reduce coke production.

CENTRAL PLANTS:

Design of plant and distribution system for both air-butane and undiluted vapor types; measurement and other operating problems; town survey; sales organization; rates and billing.

BOTTLED GAS DISTRIBUTION:

One-drum distribution; two-drum distribution; bulk stations; sales organization; rates and billing; utility co-operation on bottled gas sales; competitive fuels; combining central plant and bottled gas service; railway, marine and other special installations.

INDUSTRIAL USES:

Comparative costs of liquefied gases, coal, oil, manufactured and natural gas; description of plant lay-outs for industrial use of liquid gases; conversion problems in changing from other types of fuel to liquid gases; present and potential field for industrial use of these products; application of liquid gas to various industrial processes.

SPECIAL REFERENCE FEATURES:

(a) Directory of central plants, listing the towns served (with town population), date service began, type of service, type of distribution system.

(b) Directory of bottled gas distributors.

(c) Catalogue Section: Detailed specifications of equipment and appliances designed especially for this industry.

(d) Index: Cross-referenced by subjects and authors.

(e) Buyers' Guide: A commodity directory of appliances and equipment, with names and addresses of all manufacturers serving the industry.

.... Send No Money—But Order Now! ....Use the Handy Coupon

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..... 193....

Enter my order for.....copies of the *Handbook, Butane-Propane Gases*, at Five Dollars ($5.00) per copy, for which I will remit $.....upon receipt of same.

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Preparing the Anthony Joint before bolting.

Our pipe bears this trademark of The Cast Iron Pipe Research Association.

The artist's sketch shows an Anthony Joint being prepared for assembly in a cast iron high pressure gas line. This is a mechanical joint based on the "stuffing-box" principle. Tests and service under medium and high pressures have *proved* it gas-tight. And *how* it saves time. Just place the rubber gasket and tighten two rings. Available with de Lavaud pipe or pit cast pipe and fittings. All parts interchangeable.

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U. S. CAST IRON PIPE

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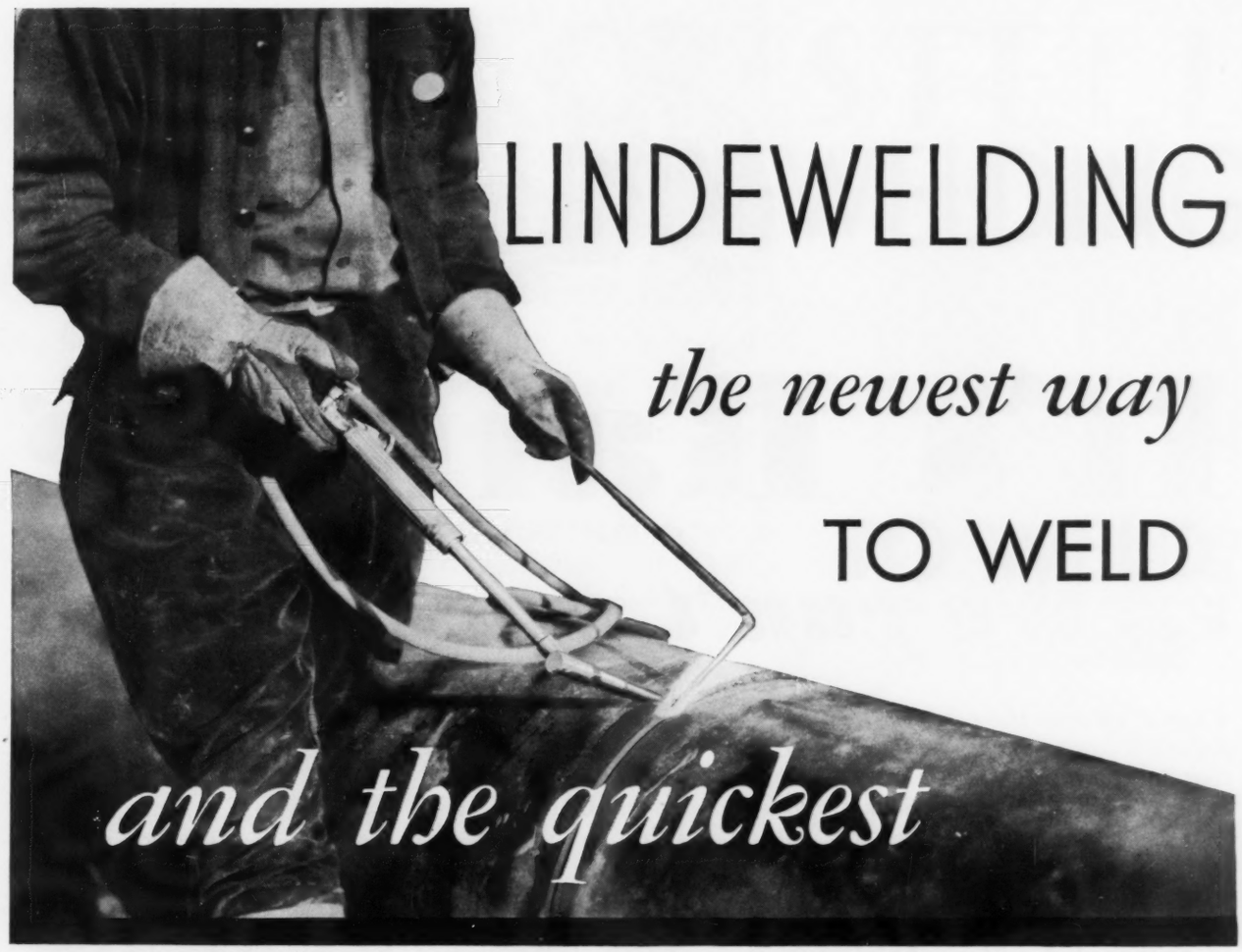

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the newest way

TO WELD

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ON 15 major pipe lines completed in East Texas, 50 per cent. of the total oxy-acetylene welded mileage is Lindewelded.

Why, in scarcely more than a year, has this new method of oxy-acetylene welding been adopted by leading pipe line builders in every part of the country?

The answer is: Because it saves from 30 to 60 per cent. of the time required by ordinary methods of welding.

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Lindewelding can be done with ordinary blowpipes or with special apparatus which makes welding almost automatic and further increases its speed. Experienced welders quickly master its special technique; beginners learn it more readily than other methods.

Procedure Controls for Lindewelding are available to all users of Linde Oxygen as a part of Linde Process Service. Ask our nearest district office for full particulars.

Motion Picture Shows details of Lindewelding

Lindewelding technique differs from neutral flame welding technique in that it employs a special rod, a special flame adjustment, and the "backhand" method of blowpipe manipulation. The actual steps in making a Lindewelded joint are shown in our motion picture, "The Lindeweld Process for Pipe Line Construction". This picture will be loaned free of charge to pipe line officials and welding or engineering societies. It is furnished in 16 mm. and 35 mm. safety film and can be obtained by writing to any Linde District office.

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126 Producing Plants UCC 627 Warehouse Stocks

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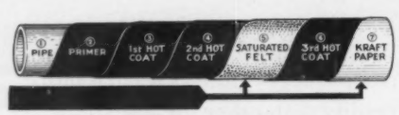
It's Raining

...We can't work today!

When it rains in the field, work suffers. You cannot successfully coat and wrap pipe in the field under bad weather conditions. The weather becomes an item of expense. It slows up or halts work. With General Paint Corporation's Hill-Hubbell Process of mill-coated and wrapped pipe, weather conditions are always ideal because the coating and wrapping are applied at the pipe mill under controlled temperatures. No moisture can be entrapped. The problem of mud and grease of field-coated and wrapped pipe is entirely eliminated.

Such has been industry's demand for this first successful process of wrapping and coating pipe at the mill, that over 5,000 miles (over 15,000 car-loads) of Hill-Hubbell mill-wrapped pipe have already been laid. The largest gas and oil companies in the United States use Hill-Hubbell mill-coated and wrapped pipe.

General Paint Corporation's Hill-Hubbell pipe wrapping equipment is installed in seven of the largest and most strategically located steel plants in the United States, in order to give complete service for all orders. Sizes from ¾ in. to 26 in. are efficiently and economically protected.



Felt and Kraft wrapping applied under tension.

Plants for coating and wrapping by the Hill-Hubbell Process are located in the following cities for the production of the pipe manufacturers listed:

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YOUNGSTOWN SHEET AND TUBE COMPANY, *Indiana Harbor, Ind., and Youngstown, Ohio*

For complete information write to any of the offices of the General Paint Corporation listed below.

HILL-HUBBELL DIVISION OF

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New York, 11 Broadway
Chicago, address Hill-Hubbell & Co., 105 West Adams Street

Portland, Ore., Seattle, Wash., Houston, Texas, Spokane, Wash.

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A GRIP OF STEEL

connects the joints of plain end pipe when Dayton Couplings are used.

In addition to strength, Dayton coupled lines are flexible to conform to physical features of the terrain and unusual climatic changes, and remain permanently tight and leak-proof under all conditions.

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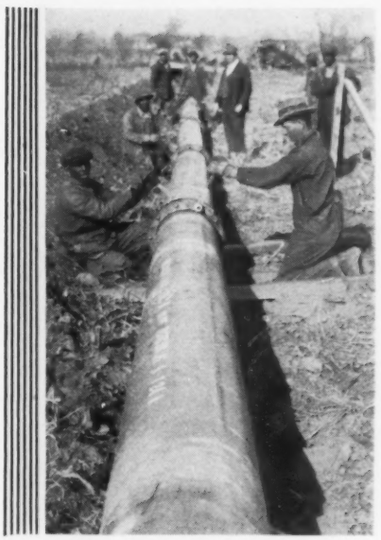
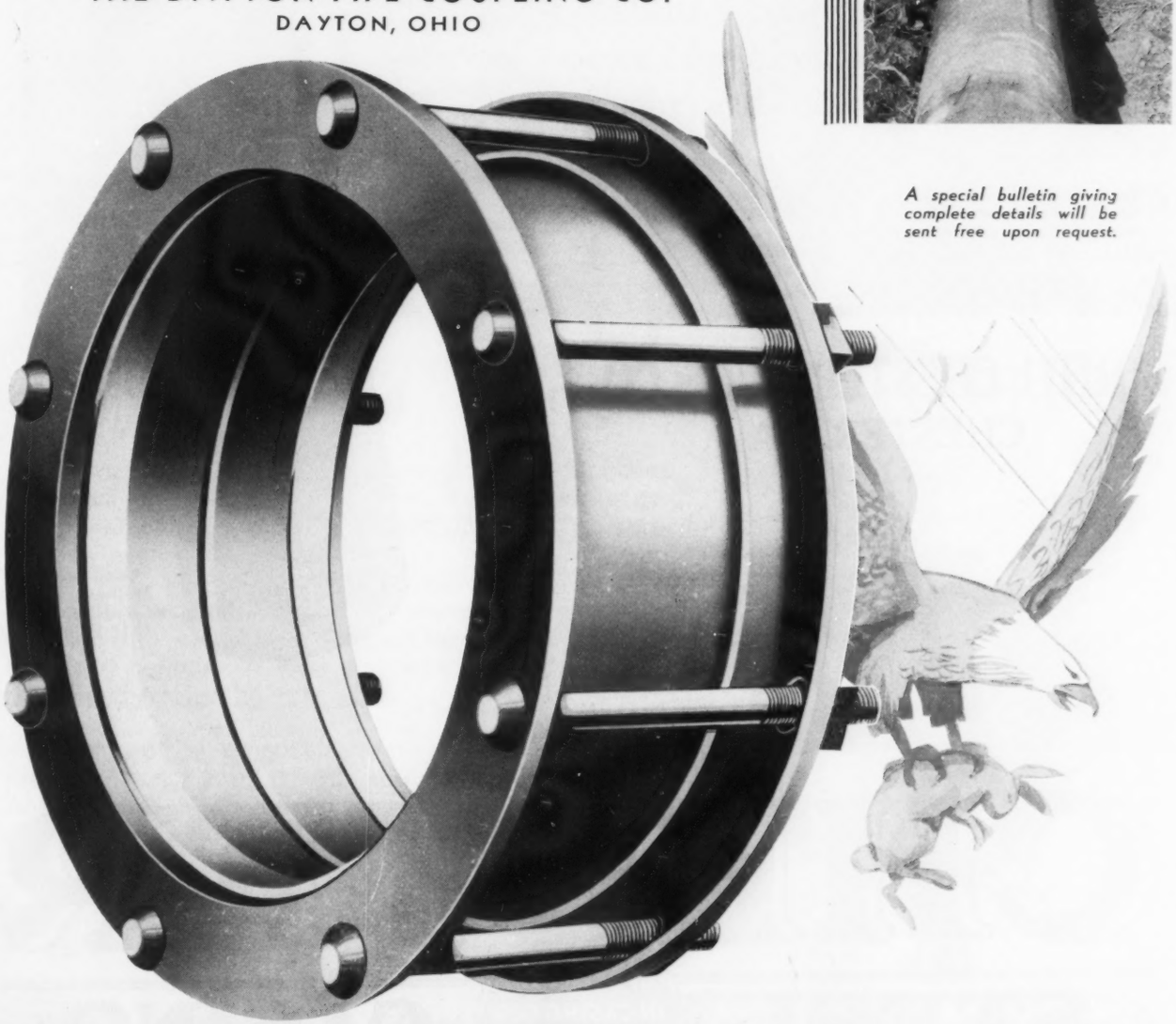
DAYTON, OHIO



A special bulletin giving complete details will be sent free upon request.



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The Satisfied Customer Uses "Chester" Pipe

He has more than 30 years' knowledge and experience back of the pipe he uses.

The wonderful performance and excellent reputation "Chester" pipe has enjoyed—with its 7-fold inspection—insures him that he is getting the best he can buy. The knowledge that he can get it at 26 strategically located distributing centers insures him prompt service.

Chester also makes all classes of Genuine Wrought Iron Line Pipe and Copper Bearing Steel Pipe.

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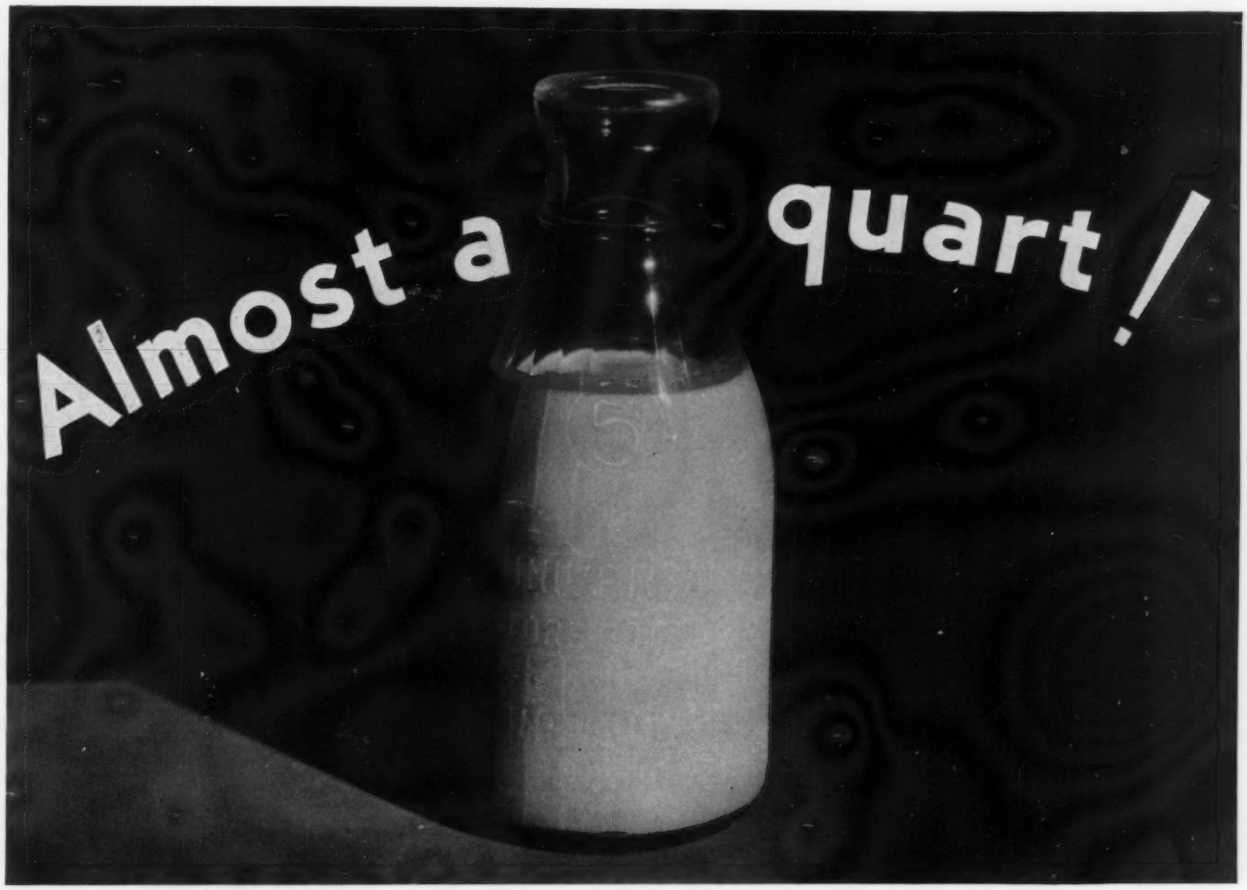
STEEL LINE — **SPECIALISTS IN CASING FOR DEEP WELL DRILLING** — **CASING PIPE**



But It Won't Bring A Quart PRICE!

If you were handling milk you could tell at a glance how much you were buying or selling. But you can not see cubic feet of gas and you can not check gas measurement by eye!

Reliable, accurate meters are necessary in gas measurement. To be reliable a meter must STAY accurate over long periods. It must stay accurate without TOO frequent checking.

Because of its Straight Line Motion the Foxboro Orifice Meter will maintain its extreme accuracy LONGER THAN ANY OTHER and its maintenance cost is the lowest. We stand ready to prove this any time and any where.

If you buy or sell gas, our new bulletin, "Orifice Meters for Gas", No. 176-J, should be on your desk. Write for it today.

The Foxboro Orifice Meter

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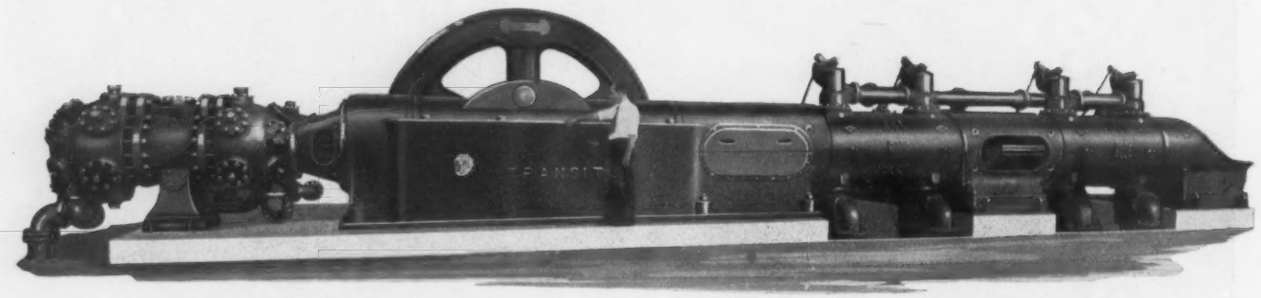
THE COMPASS OF INDUSTRY

Instruments for Controlling, Recording, and Indicating Temperature, Flow, Level, and Pressure

Built Solid and Strong *for* Maximum Rigidity

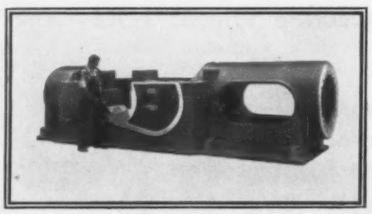


TRANSIT TWIN TANDEM - 1200 H. P. - FOUR CYCLE - DOUBLE ACTING
DIRECT CONNECTED - OPPOSED TYPE - GAS ENGINE COMPRESSOR

THE TRANSIT 1200 horse power gas engine gas compressor has been carefully designed and built for maximum strength and rigidity. It is not a mass of iron or steel hurriedly designed and thrown together.

There are no novelties. Only those constructions which have been proved by many years of experience in the building of gas engines have been retained.

The main frame is the backbone of an engine. In this engine it is cast in one piece. The frame is of the barrel type construction with a heavy box section for the crank pit. This combination of barrel and box construction insures great strength and rigidity. The heavy box section in which the main bearings are located is carried well above the center line of the cylinders for additional strength and rigidity. The weakening effect of the gap in the frame is entirely eliminated by a tie bolt.



MAIN FRAME

To take care of the load transmitted by the power cylinders with the least possible moment on the shaft, the bearings are kept short and located as near the center line of the cylinders as is possible. The main bearings are of the quarter box type and are 16-½ inches in diameter.

The main shaft is 16-½ inches in diameter throughout its entire length.

As set forth above, and in every detail, great strength and rigidity is the rule—there are no exceptions.

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FOR HOT OIL
and every other refinery service
TRANSIT (CURTIS) ROTARY PUMPS
PIPE LINE PUMPS

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FIELD PUMPS
TOOLS
for Pipe Line Construction
GAS ENGINES
GAS ENGINE GAS COMPRESSORS

NEW YORK PHILADELPHIA CLEVELAND PITTSBURGH LOS ANGELES HOUSTON TULSA NEW ORLEANS

3 miles of cast iron pipe with
MECHANICAL JOINTS
for high pressure supply line

AN interesting installation of cast iron pipe for a high-pressure (75 pounds) natural gas supply line running through marshy territory with a high water level at certain times of year.

Three miles of 18-inch cast iron pipe with *mechanical joints* was installed with dispatch and comparative ease.

The joints used are based on the "stuffing-box" principle employing rubber gaskets with follower rings. This principle is embodied in several designs of mechanical joints made by members of The Cast Iron Pipe Research Association. In field tests, and in actual service under medium and high pressures, it has been conclusively demonstrated that these joints are *gas-tight.*

For further information write to The Cast Iron Pipe Research Association, Thomas F. Wolfe, Research Engineer, 309 Peoples Gas Building, Chicago, Ill.

Cast iron pipe bearing the "Q-check" trademark is obtainable from the following leading pipe founders: Alabama Pipe Company, Anniston, Ala.; American Cast Iron Pipe Company, Birmingham, Ala.; James B. Clow & Sons, 219 N. Talman Avenue, Chicago, Ill.; Donaldson Iron Company, Emaus, Pa.; Glamorgan Pipe and Foundry Company, Lynchburg, Va.; Lynchburg Foundry Company, Lynchburg, Va.; National Cast Iron Pipe Company, Birmingham, Ala.; United States Pipe and Foundry Company, Burlington, N. J.; Warren Foundry and Pipe Corp., 11 Broadway, New York.

CAST Q IRON

Look for the "Q-check" symbol as shown above. It is the registered trademark of The Cast Iron Pipe Research Association.

© 1932 The Cast Iron Pipe Research Association

CAST IRON PIPE

...and now this
New *Distinctive* Case!

IN keeping with BRISTOL'S established reputation for instrument accuracy, which for so many years has been accepted by industry as the standard of precision, BRISTOL announces a distinctively new instrument case for BRISTOL'S pressure, temperature and other recorders.

Of the popular rectangular design, this new model possesses handsome appearance combined with genuine commercial utility. Pressure-cast of corrosion-resisting aluminum alloy, it has an inherently smooth surface which makes possible an invitingly attractive finish, either in black, white or aluminum as desired.

Although thirty-five per cent lighter in weight, the case is unusually strong and rigid. In fact, due to the rigidity of the "trunk type" door, only a single toggle clamp is needed for locking the door snugly. This clamp is both quick opening and quick closing.

A permanently resilient sponge rubber cord gasket makes and keeps the case absolutely dust-proof, moisture-proof and fume-proof. The use of this special gasket, like the selection of aluminum alloy for the case, reflects the high standard of BRISTOL'S craftsmanship.

Hinges are substantial. The glass window is retained in position by a sprung metal ring. Inverted pen arm is standard. Single or multiple records. For surface or flush mounting; front, top or back connected.

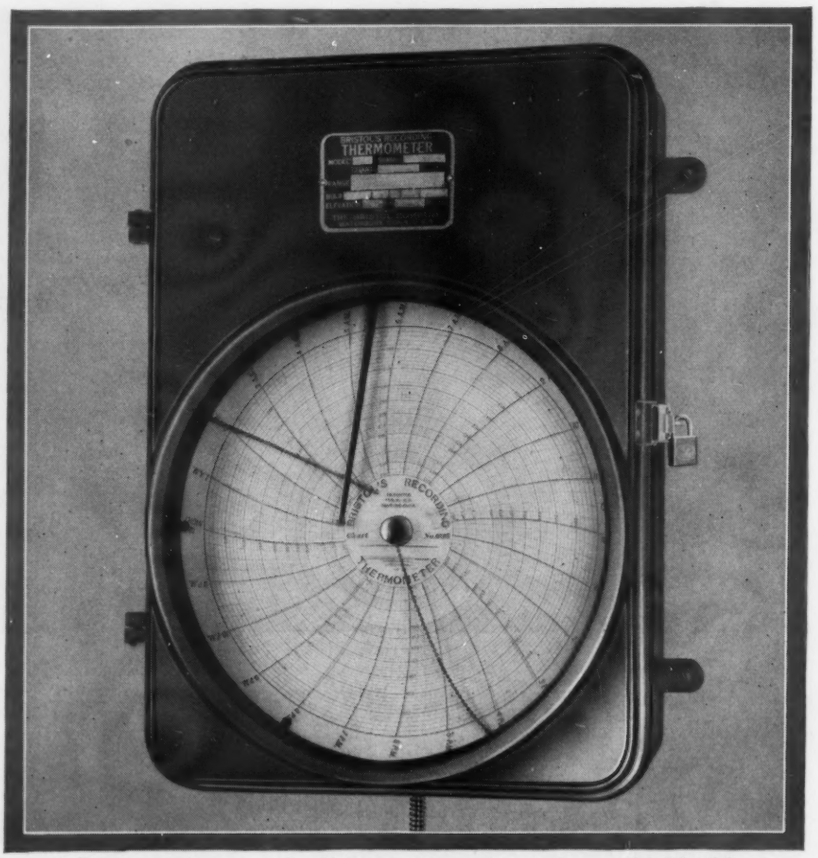
When you see this new case, we are certain you, too, will agree it marks another BRISTOL achievement in instrument design. Upon request, we will gladly give you further details of interest.

●

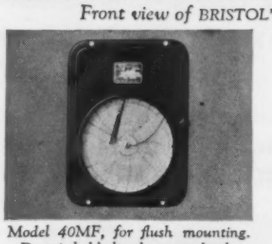
These BRISTOL'S Recorders will be equipped with the new case: Pressure Gauges, Vacuum Gauges, Liquid Level Gauges, Thermometers, Psychrometers, Voltmeters, Ammeters, Wattmeters, Frequency Meters, Time Totalizers, Tachometers, Mechanical Motion, Air Operated Controllers, Electric Operated Controllers.

THE BRISTOL COMPANY
WATERBURY CONNECTICUT

Branch Offices: Akron, Birmingham, Boston, Chicago, Denver, Detroit, Los Angeles, New York, Philadelphia, Pittsburgh, St. Louis, San Francisco

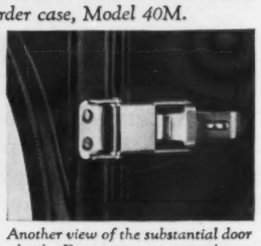


Front view of BRISTOL'S handsome new rectangular recorder case, Model 40M.

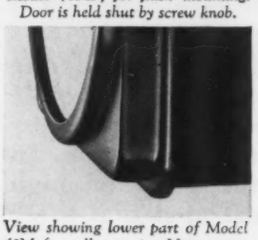


Model 40MF, for flush mounting. Door is held shut by screw knob.

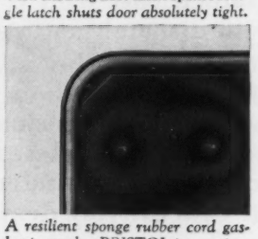
View showing door latch open. A single latch shuts door absolutely tight.



Another view of the substantial door latch. Easy to open, easy to shut.



View showing lower part of Model 40M, for wall mounting. Note strong, rugged "trunk type" design.



A resilient sponge rubber cord gasket is another BRISTOL innovation. Makes and keeps case moisture-proof.

Door hinges integral with case. Surface mounting lugs to same drilling dimensions as on old cast iron cases.

TRADE MARK
BRISTOL'S
REG. U. S. PAT. OFF.

INSTRUMENTS FOR INDICATING RECORDING CONTROLLING SINCE 1889

"For every joint on the line"

Over the top with Victaulic

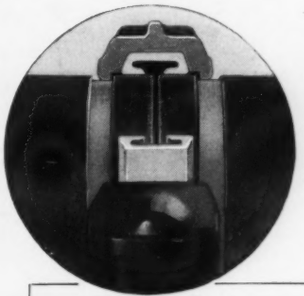
In the mountainous country of West Virginia, this natural gas line of the South Penn Oil Company was installed Victaulic-coupled throughout. Six miles of pipe that is standing the "gaff" and is adding a saving in upkeep to the saving in time and labor of installation.

* * *

Victaulic Couplings are available in all sizes from ¾" up for vacuum and pressure—for steel, wrought iron and cast iron pipe. Mail coupon below for descriptive bulletin.

VICTAULIC COMPANY OF AMERICA
26 Broadway New York

"For every joint on the line"



VICTAULIC DISTRIBUTORS

HANLON-WATERS, INC.
Tulsa, Oklahoma
BELL & GOSSETT CO.
Chicago, Ill.
R. J. CROZIER CO.
Philadelphia, Penn.
McJUNKIN SUPPLY CO.
Charleston, West Virginia
H. D. FOWLER CO.
Seattle, Washington
CASE HARDENING SERVICE CO.
Cleveland, Ohio
DUCOMMUN CORPORATION
Los Angeles, California
INDUSTRIAL SUPPLY CO.
Salt Lake City, Utah
PETERSON COMPANY
Denver, Colorado
NEVILLE & CLEARY, INC.
Atlanta, Georgia
MERRITT M. STONE CO.
St. Louis, Missouri
F. S. VAN BERGEN
Minneapolis, Minn.
VIRGINIA ENGINEERING CO.
Richmond, Virginia
A. B. CAREY
Mexico, D. F.
C. H. ELSTNER
Monterrey, N. L. Mexico
VICTAULIC COMPANY
of Canada, Ltd.
Toronto, Ontario, Canada

FLEXIBLE LEAK-PROOF

VICTAULIC

REG. U. S. PAT. OFF.

PIPE COUPLINGS

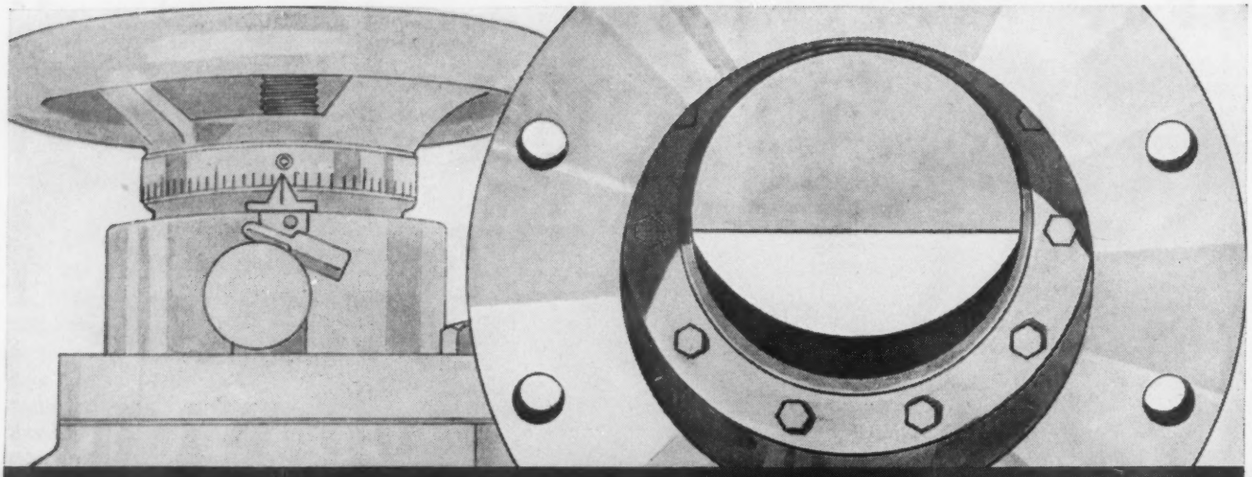
VICTAULIC COMPANY OF AMERICA
26 Broadway New York

Please send me VICTAULIC BULLETIN No. 6

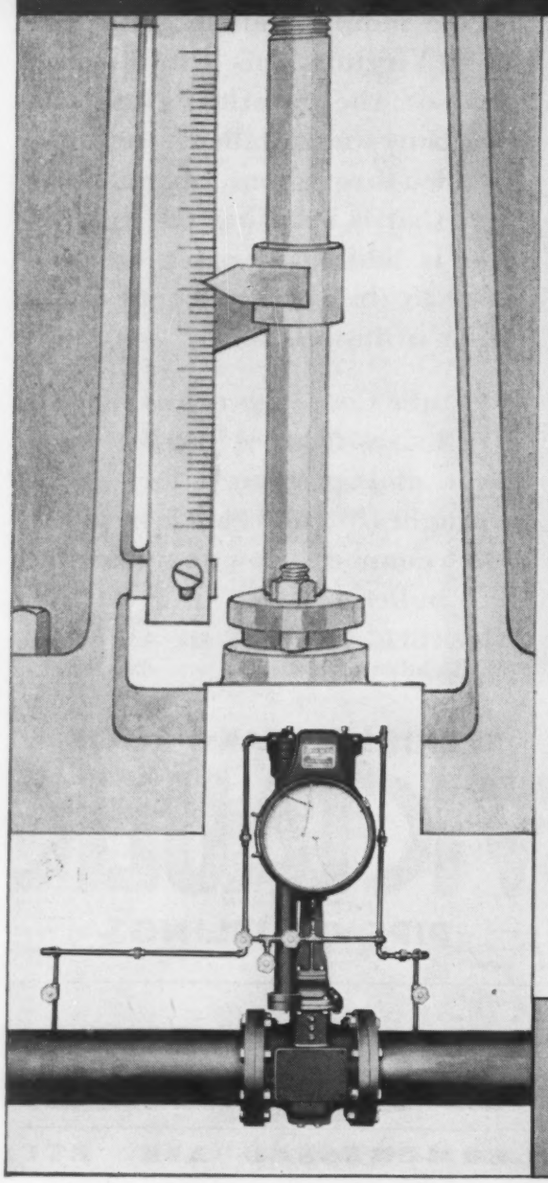
Name _____

Address _____

FOR OIL, GAS, WATER, SEWAGE, COMPRESSED AIR, ETC.



ADJUSTABLE



80 accurate sizes IN ONE ORIFICE

» Where the rate of flow may vary widely—as at town border gas stations—the Metric Wide Range Orifice is particularly well adapted to measuring gas, steam or liquids.

» The size of the orifice is changed by merely unlocking the hand wheel and rotating it one or more complete turns. Each revolution produces a movement of 0.100 inch—accurate to less than 0.002 inch. The distance that the slide is above the zero position is clearly indicated on a rigidly fastened scale.

» Since the diameter of the circular orifice is three-fourths the diameter of the pipe, the locked positions of the slide are equivalent in a twelve-inch line to fixed orifices of eighty different sizes.

A more detailed discussion will be found in Bulletin E-15, which will be sent on request.

METRIC METAL WORKS *ERIE, PENNSYLVANIA*

AMERICAN METER COMPANY

INCORPORATED

ESTABLISHED 1836

GENERAL OFFICES : 105 W. 40TH STREET · NEW YORK, N.Y.

AMERICAN METER CO. MEASUREMENT ENGINEERS CUBIC FEET

PUBLICATION OFFICE:

LOS ANGELES
124 West Fourth Street
Michigan 1481

DISTRICT OFFICES:

SAN FRANCISCO: 447 Sutter St.
Garfield 2772

NEW YORK: 110 E. 42nd St.
Ashland 4-8711

WESTERN GAS

"Reg. U. S. Pat. Off."

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OFFICIAL PUBLICATION:

THE PACIFIC COAST GAS ASSOCIATION

AND

THE SOUTHERN CALIFORNIA METER ASSOCIATION

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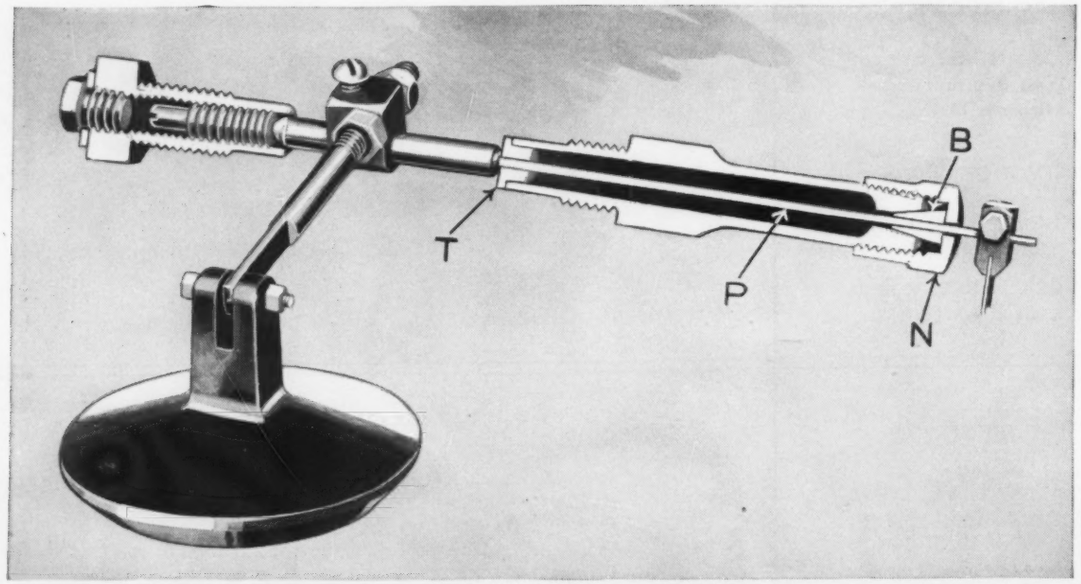


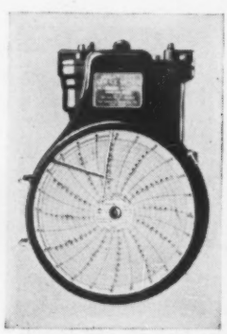
DEPENDABLE

Dependability is virtually a part of the design and construction of Westcott Orifice Meters. There is but one movable joint from the float to the chart record.

The heat treated stuffing box, for instance, is of hardened stainless steel and is equipped with a heat treated stainless steel bushing B. This is lapped on bearing shaft P and adjusted by means of N until the clearance is such that air passes at the rate of 0.5 to one cubic foot per hour at 700 pounds when dry.

The stuffing box is subsequently filled with grease, thus preventing any leakage. Other interesting features found in Westcott Orifice Meters include the forged steel mercury chambers, the high pressure chamber of which in the 50" and 100" sizes for example is interchangeable.

Dependability in every part and function is reflected in low maintenance and economical accurate operation. Bulletins E-2 and 16 describe other known factors in the value of Westcott Orifice Meters and Metric Integrating Orifice Meters.



Copies will be sent on request.

METRIC METAL WORKS *ERIE, PENNSYLVANIA*

AMERICAN METER COMPANY
INCORPORATED
ESTABLISHED 1836
GENERAL OFFICES : 105 W. 40TH STREET · NEW YORK, N.Y.

METRIC METERS
AMERICAN METER CO
MEASUREMENT ENGINEERS
CUBIC FEET

April, 1932

WESTERN GAS

"Reg. U. S. Pat. Off."

Vol. VIII, No. 4

A Monthly Journal of the Gas and Gas Appliance Industries in *Western America*

Cooperative Sales Campaigns *in* Northern California

By BERT W. REYNOLDS

Special Representative
Pacific Gas and Electric Company

THIS discussion reviews the background of the Pacific Gas and Electric Co. dealer cooperative program, which has been developed over a number of years. Particular reference is had to current campaigns on automatic gas water heating and house heating.

Mr. Reynolds, it will be noted, cautions the reader against drawing the conclusion that what has worked for the P. G. and E. will work for every company. Dealer programs must vary with local conditions, but when this fact is given its proper weight, much value can be gained from examining the plans which individual companies have in successful operation. Mr. Reynolds' discussion was given before the Pacific Coast Gas Association's Mid Winter Conference held in February at Los Angeles.—EDITOR.

A COOPERATIVE selling campaign plan which is outstandingly successful for one utility may prove absolutely ineffective and even detrimental if adopted by another. The success of a selling campaign, after all, depends upon the care with which the details are worked out to fit the territorial conditions where the campaign is to be located.

The Pacific Gas and Electric Co. has gone through a good many years experimenting with cooperative selling, and while we feel that we have made considerable headway I have prefaced my remarks with this word of caution lest the intention with which these remarks are made be misconstrued.

To have a successful cooperative selling campaign it is essential that the utility have the *confidence* of all those who are to cooperate in the campaign, whether they be employees or dealers. To secure a fair degree of dealer confidence is a difficult and long drawn out job, particularly when the utility is progressive in the promotion of its business. I feel that it would be unfair to tell of the cooperative selling campaign which my company is now conducting or of others which are proposed for 1932 and not first describe the background work that we have done with dealers in our territory to gain their confidence and thereby pave the way for a constructive drive for business.

A Written Policy: In the first place, we believe that appliance manufacturers, jobbers and dealers are a vital factor in the promotion of our business and have included them in our appliance sales policy which has been written, stated and repeatedly printed and distributed among the dealers throughout our territory. This written policy has proven most valuable and in many cases has acted as sort of a guide to keep us on the right road.

Contact Men: We have special dealer contact men, known as Dealer Cooperative Representatives. There is one of these men in each of the leading divisions. Their duties are to keep dealers posted regarding the activities and policies of the company; to hold meetings with dealer's salesmen; to explain rates and to promote generally the sale of appliances through dealers. We maintain a card file of all dealers in our territory, classified as to the kinds and types of appliances which they sell.

Advertising: The company's advertising directs readers to see their dealer or the P. G. and E., and each month a broadside is sent to all dealers in our territory of service, showing reproductions of the ads that will be run during the coming month and inviting them to tie-in with their advertising on the same page; it being pointed out that the company's advertising tells what the appliance will do and how conveniently and economically it will do it, and that we expect the dealers' advertising to tell where to buy it, how much it will cost, and how easily it can be purchased.

Dealer Quotas: Annual quotas are set for dealers in our various districts and each division's accomplishments are measured in terms of Dealer Quota as well as direct Sales Quota, thus affording an incentive for our divisions to work with dealers. Dealer Cooperative Representatives receive a report of dealer sales once each month, classified by appliances.

Dealer-Company Meetings: Numerous meetings are held with dealers during the year, either through the Gas Appliance Society, the Furnace Dealers

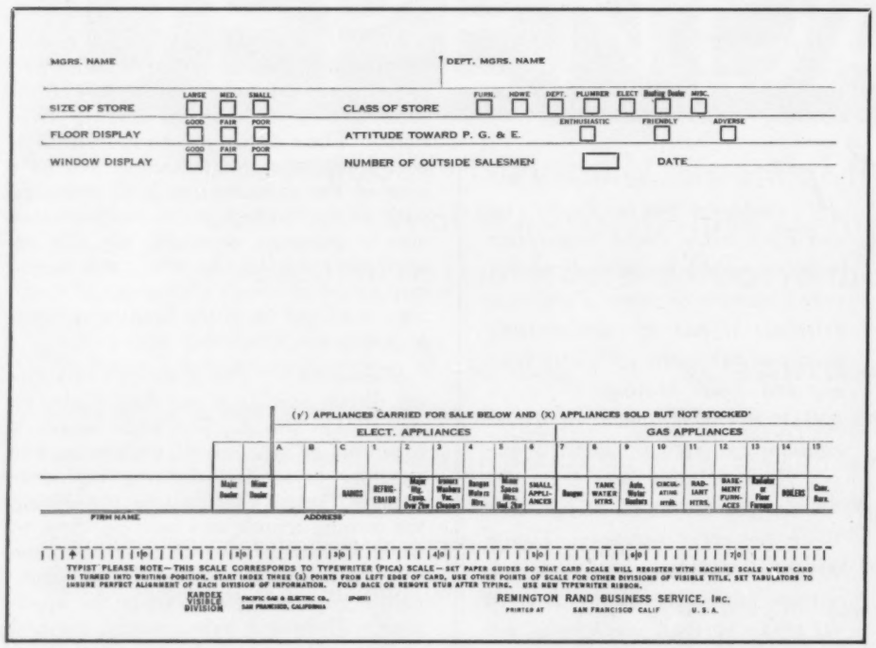
DIRECT PROSPECTS TO *YOUR* STORE WITH TIE-IN ADVERTISING

Your local newspaper will give you the dates these advertisements will appear . . . .

This group of four water heater advertisements is to be published, in various sizes, in all Daily and Weekly newspapers in Natural Gas territory during February. These advertisements have also been revised to fit conditions in those towns where manufactured gas is served by this Company.

Total space to be used during February will approximate 110 newspaper pages of 160 column inches each. Thus, the miniature reproductions of water heater advertisements, shown above, do not do justice to their actual size. Nor do they give any indication of the stupendous volume of advertising to be devoted to this appliance. Remember, this is to be the largest advertising campaign ever sponsored by Pacific Gas and Electric Company. You may obtain proofs of all water heater advertisements in their actual size from the local P. G. and E. office.

A typical broadside circulated to dealers by Pacific Gas and Electric Co. This circular is in the interest of a current campaign for automatic water heater load. On the reverse side of this appeared a letter to dealers in the territory explaining the cooperative campaign plan.


MGRS. NAME
DEPT. MGRS. NAME
SIZE OF STORE
CLASS OF STORE
FLOOR DISPLAY
ATTITUDE TOWARD P. G. & E.
WINDOW DISPLAY
NUMBER OF OUTSIDE SALESMEN
DATE
(Y) APPLIANCES CARRIED FOR SALE BELOW AND (X) APPLIANCES SOLD BUT NOT STOCKED
ELECT. APPLIANCES
GAS APPLIANCES
FIRM NAME
ADDRESS
TYPIST PLEASE NOTE—THIS SCALE CORRESPONDS TO TYPEWRITER (PICA) SCALE—SET PAPER GUIDES SO THAT CARD SCALE WILL REGISTER WITH MACHINE SCALE WHEN CARD IS TURNED INTO WRITING POSITION. START INDEX THREE (3) POINTS FROM LEFT EDGE OF CARD. USE OTHER POINTS OF SCALE FOR OTHER DIVISIONS OF VISIBLE TITLE. SET TABULATORS TO INSURE PERFECT ALIGNMENT OF EACH DIVISION OF INFORMATION. FOLD BACK OR REMOVE STUB AFTER TYPING. USE NEW TYPEWRITER RIBBON.
KARDEX VISIBLE DIVISION
REMINGTON RAND BUSINESS SERVICE, Inc.

Card form on which information regarding dealer sales activities is recorded for filing by Pacific Gas and Electric Company.

Association, or with independent dealers. At the beginning of each year a large mass meeting is held in San Francisco at which time the complete program for the year is presented to the entire industry.

Dramatization: Our program this year was also given to dealers and our employees by means of a road show. The road show was a dramatization of the 1932 load building program. There were 14 in the troupe and 14 different performances were given in the leading cities and towns throughout our system. Dealers, manufacturers, distributors, jobbers, and their salesmen and representatives as well as our employees and their families were invited to attend. The show was designed to tell of the 1932 sales program and to show the interdependence of utility salesmen, employees, and appliance dealers.

The show was written around the theme of Alexandre Dumas' "Three Musketeers," Athos, Porthos, and Aramis; the salesmen of the company representing the first musketeer, the employees of the company the second, and the dealers the third, pointing out that to secure a large sales volume in 1932 they must combine forces and "all for one and one for all" attack the sales problems of 1932. This message was put over in the form of three skits and was followed by an inspirational skit—a dramatization of Peter B. Kyne's story, "The Go Getter". The show played to a total audience in excess of 7500 and, according to statements received and comments made, put the story over in a way that was unique and most effective.

Sales Practices: The company maintains standard prices and adheres to generally accepted practice regarding terms and trade-in allowances on various types of appliances which it sells. The company also restricts its direct sales activity to those appliances which require pioneering, creative, and specialized sales effort to the end that their existing distribution facilities will be loaded quickly, and does not exploit the appliance market for a merchandise profit.

We leave the dealers the sale of appliances which have attained sufficient public acceptance so that consumers generally will buy them in preference to competitive types of equipment which will render a similar service; providing, however, that the dealers are enthusiastic about selling them and will pursue an aggressive program that will insure the public being adequately served and the interest of the Pacific Gas and Electric Co. being protected.

1932 Campaigns: The sales campaigns for 1932 have all been planned ahead and we have set up in the 1932 load building program of the company a schedule of sales activities and coordinated sales promotional media; in this way we know in advance exactly when the various campaigns will be held, and what promotional media will be used.

The first campaign scheduled for 1932 is the automatic gas water heater campaign, for a four months period, from February 1 to May 31. To secure a large volume of automatic gas water heater sales during a period when people are watching their dollars rather closely, it is axiomatic that some inducement must be made for the public to "buy now." Inasmuch as the company could not hope to do the job alone and inasmuch as we are committed to the maintenance of prices, terms and allowances, it was immediately recognized that it would be necessary for the entire water heater industry in our territory of service, to agree upon some special plan that

DEALER'S CONFIDENTIAL REPORT OF DOMESTIC APPLIANCE SALES

for Month of _____, 193

Dealer

GAS APPLIANCES	NUMBER SOLD DURING THE MONTH	ELECTRIC APPLIANCES	NUMBER SOLD DURING THE MONTH
Ranges		* Ranges-Individual	
Cookers		Ranges-Apartment	
		* Water Heaters	
Auto. Water Heaters		* Air Heaters 2 KW or over	
Non Auto Water Htrs.			
		Air Htrs. under 2 KW	
Boilers		Refrigerator Compressors Dom. / Com. / Apt. *	
Basement Furnaces		Ironing Machines	
Floor Furnaces		Dish Washers	
Circulators			
Radiators		Washing Machines	
Radiant Heaters		Vacuum Cleaners	
Conversion Burners		Floor Polishers	
COAL AND OIL APPL.		Sewing Machines	
Coal Boilers		Radios	
Oil "			
Coal Furnaces			
Oil "			
Coal Circulators			
† Coal Ranges			

* Break down this report of Electric Ranges, Electric Water Heaters and Electric Air Heaters of 2 KW or over, in detail in space provided on reverse side of this form.

* The apartment house refrigerator compressors reported here provide refrigeration in _____ kitchens.

† Ranges with top gas burners but without separate gas ovens to be classed Coal Ranges.

REMARKS:

PACIFIC GAS AND ELECTRIC COMPANY

DIVISIONAL MONTHLY DEALER COOPERATIVE REPRESENTATIVE REPORT

_____ Division Month of _____ 193 ___

DEALER SALES

1 GAS APPLIANCES	2 No. Reported	3 No. Estimated	4 Total	5 ELECTRIC APPLIANCES	6 No. Reported	7 No. Estimated	8 Total
Ranges				Ranges-Individual			
Cookers				Ranges-Apartment			
				Water Heaters			
Auto. Water Heaters				Air Heaters 2 KW or over			
Non Auto Water Htrs.							
				Air Htrs. under 2 KW			
Boilers				Refrigerator Compressors Dom. / Com. / Apt. *			
Basement Furnaces				Ironing Machines			
Floor Furnaces				Dish Washers			
Circulators							
Radiators				Washing Machines			
Radiant Heaters				Vacuum Cleaners			
Conversion Burners				Floor Polishers			
COAL AND OIL APPL.				Sewing Machines			
Coal Boilers				Radios			
Oil "							
Coal Furnaces							
Oil "							
Coal Circulators							
† Coal Ranges							

	MAJOR	MINOR	TOTAL
No. of Dlrs. now Carded			
No. of Individual Contacts			
No. of Dlrs. Reptg. Sales			

DEALER MEETINGS

KIND OF DEALERS	No. Held	No. Attending
Heating Group		
Water Heater Group		
Range Group		
Electric Group		
Gen. or Misc. Group		

EDUCATIONAL TALKS IN STORES AS FOLLOWS:

Store	Subject	Attendance

COMPANY ADVERTISING DISTRIBUTED

Ad. No.	Subject of Ad.	No. Dlrs. Distr. To

* The apartment house refrigerator compressors reported here provide refrigeration in _____ kitchens.

† Ranges with top gas burners but without separate gas ovens to be classed Coal Ranges.

Division Mgr. Sales Mgr.

over

Two forms used by Pacific Gas and Electric Co., San Francisco, for recording dealer sales in territory served by the company. The report on the right is filled in by each division of P. G. and E.

would stimulate the water heater market. The leading manufacturers and jobbers were called in and a plan devised whereby prices and allowances would be maintained, but special terms offered which are as low as $4.85 down and $3.85 per month; the time of payment limited, however, to 30 months. This term arrangement was made possible after many conferences and consultations were held and several months were spent investigating the rates and charges of finance companies. A great amount of research work was required because there was no place we could turn that would afford a precedent wherein extended terms had been given in a cooperative campaign, the practice apparently having been for the utility to give long terms arbitrarily or else carry the dealer's paper. The finance charge investigations resulted in a schedule of carrying charges for various periods of time and on various amounts being adopted by the Pacific Gas and Electric Co. and the leading automatic water heater distributors, and the distributors agreed to arrange for their dealers to sell water heaters, on the same terms provided in the campaign and according to the finance schedule adopted. This in so far as we know is the first time that such attractive terms have been offered in a cooperative and coordinated industry drive.

During the campaign each individual dealer will use such sales promotional media as he chooses, such as newspapers, truck banners, bill inserts, etc.; and the Pacific Gas and Electric Co. will use:

1. 457 pages of newspaper advertising, of 160 column inches each.
2. 245—24-sheet outdoor posters in 64 cities and towns.
3. 830 truck banners, reproductions of the outdoor posters.
4. More than one million bill stickers, over 500,000 for each of two months.
5. Coordinated window displays.

These sales promotional media, including the newspaper advertising, all carried the slogan "see your dealer or the P. G. and E."

It was agreed to concentrate on the following buying motives:

1. **You can buy automatic gas water heaters for 50 per cent less than in 1917.**
2. **Natural gas has reduced the cost of operating automatic gas water heaters about 40 per cent.**
3. **Automatic gas water heaters are a necessity in the home today, and not a luxury; 70 per cent of all the water used in the home is hot. The most economical and admittedly the quickest and most convenient way to heat it is with an automatic gas water heater.**
4. **The easiest terms ever made available to the buying public are now being offered for a limited time.**

The quota for the campaign is 8,000 automatic water heaters. A broadside has been sent to every dealer in the territory urging him to participate in the campaign. Meetings have been held, contacts have been made. The campaign is directed toward the replacements of non-automatic heaters and water heaters using competitive fuel. The P. G. and E. restricts its direct sales activities to old buildings and the replacements of non-automatic water heaters, leaving the new buildings and sale of automatics replacing automatics to the dealers. Dealers are also given the opportunity to file their prospects for protection against P. G. and E. sales for a period of 30 days. Direct company sales are installed by dealers.

The next campaign for 1932 is the Summer Heating Campaign, starting the first of July and continuing to the first of October. While the details are not completely worked out for this year, no doubt it will be similar to one held during a like period last year, which featured:

1. A 10 per cent summer discount.
2. Monthly payments to start October 1 (deferred dating).

Inasmuch as a campaign of this kind involves a deviation from standard practice, it is, of course, necessary to call in the interested dealer groups and work the campaign out in conjunction with them so that all can harmoniously work together. This likewise is considered a major campaign and will have the full support of newspaper advertising and other sales promotional media, such as bill stickers, outdoor posters, truck banners and window displays.

(Continued on Page 45)

Distress Oil *and* Its Effect *on* Industrial Gas Sales

By H. H. FOREMAN

Sales Engineer
Southern California Gas Company

THIS discussion of distress oil and its inroads into industrial gas markets deals in particular with the southern California situation, but a parallel market condition is found in Southwestern and Mid-Continent areas, where flush oil production and chaotic oil marketing have reduced spot market prices to ridiculous levels. Mr. Foreman's remarks, given before the Mid-Winter Conference of the Pacific Coast Gas Association, will be read with interest—particularly as they refer to means for combatting this distress oil competition.
—Editor.

THE class of industrial gas load which feels oil competition most quickly and on which it has the most pronounced effect is the boiler load. Other classes of utilization usually require extensive and expensive alterations to adapt them to the use of oil, while a steam boiler can be converted from one fuel to the other with much greater facility. The more refined forms of utilization are usually uses for which oil, particularly of low quality, is not well adapted. The boiler load is therefore more susceptible to attack and remarks made hereafter apply in general to this class of load only.

In considering the present state of the oil market and its effects on the sale of natural gas for industrial purposes, it is necessary to classify the different grades of oil on the market into approximately three brackets roughly corresponding to price range and source of supply. These classes are as follows in the Southern California market, the market with which the writer is most familiar.

Class 1: Oil of good analysis marketed by the major producers at prices of 75c to 90c per barrel.

Class 2: Oil of good analysis marketed by smaller or so-called independent producers or refiners. The price range of this class is 50c to 75c per barrel.

Class 3: True distress oil, the price of which is whatever the holder can get, from 25c to 50c per barrel.

This third class in turn consists of two sub-classes

a: Spot oil of good analysis which must be sold in an already crowded market at a reduced price.

b: Oil of low grade, which cannot be marketed through the regular channels due to the producer's lack of marketing facilities. This class of oil may and usually does contain water, sulphur and other objectionable impurities.

True distress oil, that with which we are most concerned, is caused by several factors:

1. Unregulated production and saturation of market.

2. Inability of small producers to store oil after removing gasoline.

3. General business conditions which cause oil that would usually be stored, to be dumped on the market in a desperate effort to realize cash.

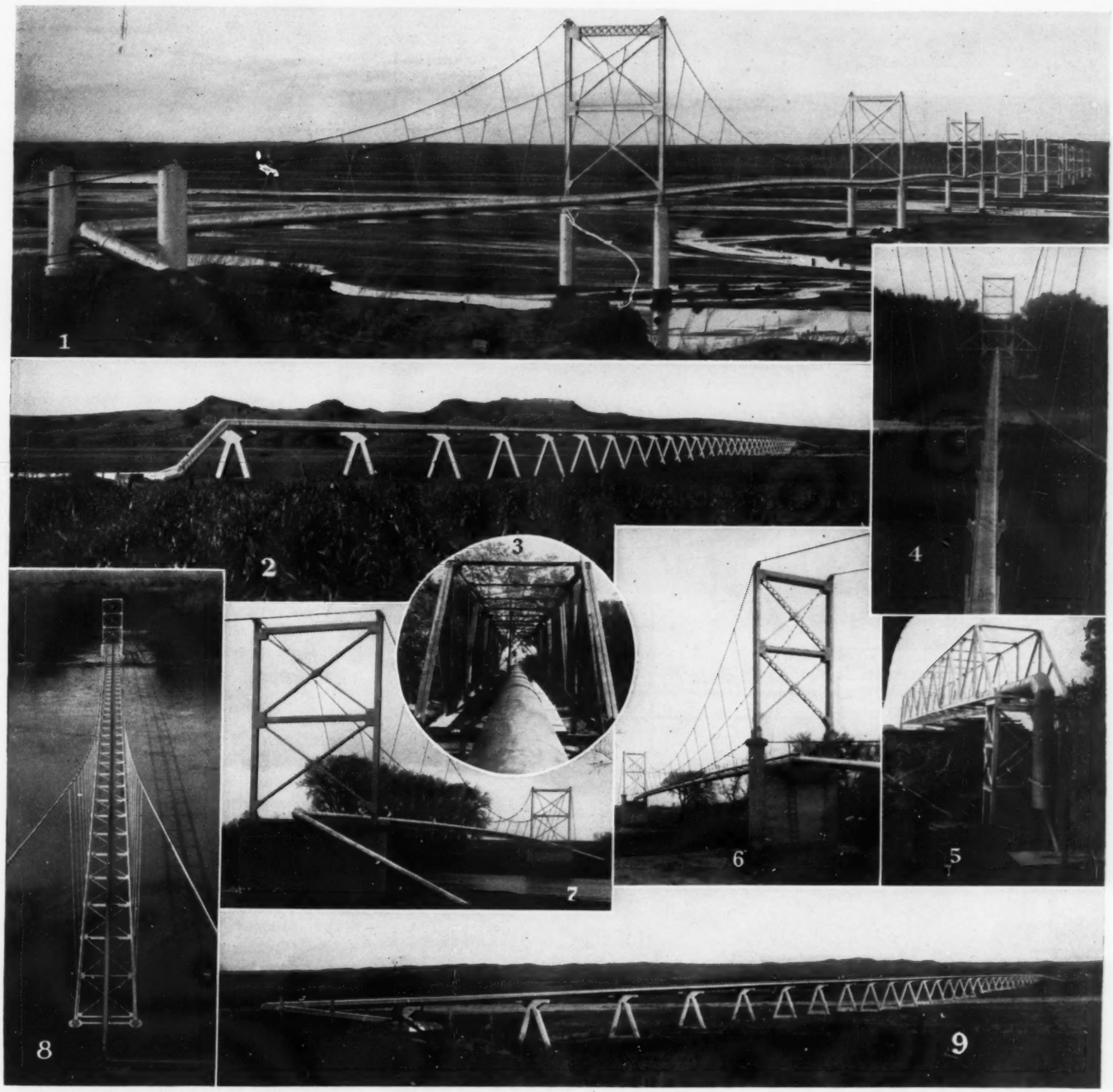
Distress oil is usually encountered at or near the producing field. The chaotic condition which allows this waste of natural resources is necessarily short lived. Fields are soon destroyed by unregulated and promiscuous drilling, and if not destroyed will usually come under control of producing companies better equipped for the marketing of their product. Spot oil offered for sale at ruinous prices is usually in relatively small quantities, so that fortunately for the gas load this form of competition is usually of comparatively short duration. Its effect on the boiler load however, may be very material.

The principal source of this oil during the past 18 months in California has been the Venice field and indirectly the Mid Continent field. The effect of the unrestricted production in Texas has been sharply felt in California. Before the opening of this field to present production level the export from California was 100,000 barrels of oil products per day. This has now dropped to 40,000 barrels per day, the consequence being that some 60,000 barrels of oil products per day have been forced onto the local market under one or the other of the last two sub-classes given above. Not all of this oil has gone into the market; some has been stored, and only a portion of the 60,000 barrels has been converted to fuel oil, but this has had an effect which has been felt to an appreciable extent by the gas utilities of Southern California. These effects have been to cause first, an entire change in fuel provisions by the customer, and second, a change in supplementary uses for which gas might normally be employed.

An investigation was made into the records of one company distributing gas to the Los Angeles area and this showed a 15 per cent loss of gross industrial revenue for 1931 as compared with 1930. Detailed investigation showed that 75 per cent of this loss was ascribable to distress oil and 25 per cent due to the general business depression. Possibly a small part of the remaining 25 per cent of this loss was due to the supplementary use of oil, not included in the 75 per cent mentioned. The normal rate of increase in consumption in this district was not attained during 1931. Undoubtedly a certain amount of new business that would have been closed under normal conditions was lost. This is part of this 25 per cent.

A third effect of oil prices was the reduction of gas rates to meet this competition. In the district mentioned, gas rates were so reduced by oil competition that on the consumption obtained, the percentage of loss by reduction in rates was approximately 5 per cent of the total loss. Therefore we may directly or indirectly ascribe 80 to 85 per cent of the loss in normal expected revenue, to reduction in oil prices. Distress oil displaced in this area approximately 1,125,000,000 cubic feet of gas in 1931. This gives a very good idea of the serious inroads into the boiler load that may be made by a protracted distress condition

(Continued on Page 52)



Pipe Line Bridges on the Northern Natural System

IN THE construction of Northern Gas and Pipe Line Co.'s 1909-mile system extending from Texas fields into Kansas, Nebraska, Iowa, South Dakota and Minnesota, serving a population of approximately 400,000 in 110 communities, the company has used 16 major pipe line bridges for river crossings, in place of the more generally used under-river construction. Numerous smaller bridges have also been constructed, and highway and railroad bridges have been utilized wherever possible. At the present time a 1,280-foot suspension bridge is being completed across the Missouri River west of Sioux City, Iowa, and will be the longest single-span pipe line bridge in the United States, according to Northern Natural engineers. The eight-span suspension bridge, shown in view 1 above, is said to be the longest pipe line bridge in the world.

In the views above, supplied through the courtesy of J. F. Merriam, director of the Department of Information, Northern Gas and Pipe Line Co., are shown the following bridges constructed for the Northern Natural System:

1. Canadian River, 3156 feet, near Borger, Texas.

2. Cimarron River, 1980 feet, near Gate, Okla.

3. Solomon River, 140 feet, near Minneapolis, Kan.

4. Little Blue River, 1020 feet, near Hollenberg, Kan.

5. Salt Creek Bridge, 100 feet, near Minneapolis, Kan.

6. Big Blue River, 340 feet, near Beatrice, Neb.

7. Elkhorn River, 320 feet, near Hooper, Neb.

8. Platte River, 780 feet, near Fremont, Neb.

9. Beaver River, 1610 feet, near Knowles, Okla.

Among other rivers spanned are the Arkansas, Saline, Republican and Smoky Hill, with bridges of 440, 140, 480 and 220 feet, respectively.

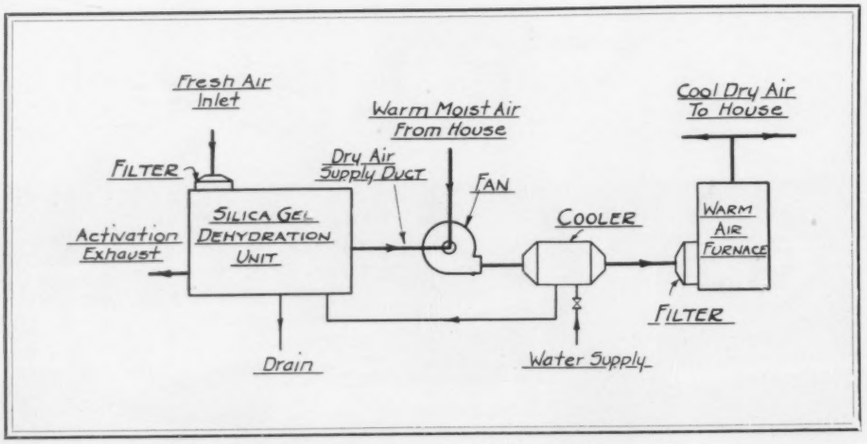


Fig. 1.

FIG. 1.

Diagrammatic flow sheet of Silica Gel summer air conditioner with warm air furnace installation.

FIG. 2.

Silica Gel summer air conditioner with boiler and heater-cooler for winter heating.

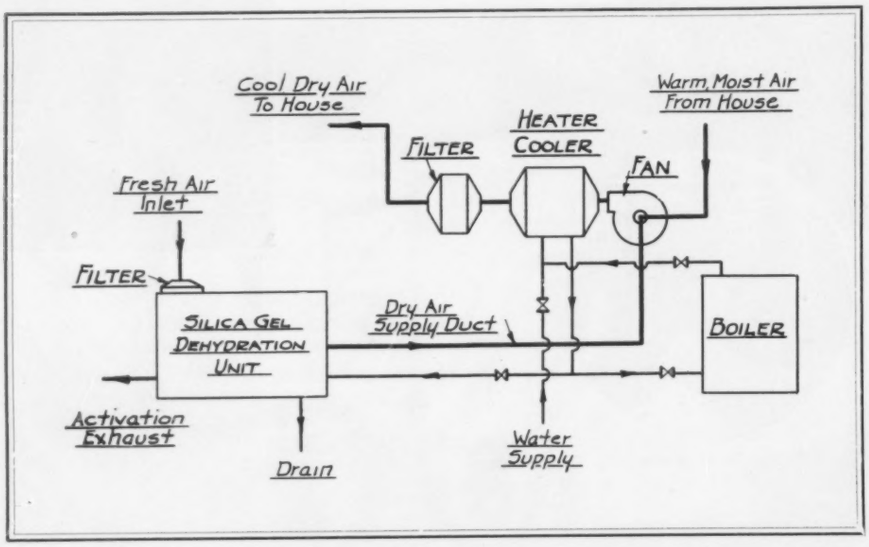


Fig. 2.

The Flow Cycle *for* Summer Air Conditioning

THE year 1932 will go down as a period in which the gas industry began to capitalize upon its development work on summer air conditioning. Accelerated interest in this subject is already very evident. Since the first of the year a number of industrial and engineering groups have placed the subject of air conditioning by gas heat energy on their convention programs, one important meeting being that of the American Society of Refrigerating Engineers and the American Society of Heating and Ventilating Engineers, at Cleveland, Ohio, late in January. At this session Eugene D. Milener, industrial research representative of the American Gas Association, presented an able paper on summer air conditioning of residences. A booth was conducted at the exposition held in connection with this meeting, at which the Silica Gel gas operated air conditioning unit had its first public demonstration.

This unit is the outgrowth of field tests sponsored by the A. G. A. Committee on Industrial Gas Research, and a description of its operation is a matter of timely interest to the whole gas industry. Through the courtesy of B. P. Fonda of the Silica Gel Corp. *Western Gas* presents four flow sheets of the air conditioner showing it as applied with warm air furnace, and with modifications adapting it to residential use under other conditions. Mr. Fonda provides the following description of the flow sheets:

Fig. 1: This shows the application of the Silica Gel summer air conditioner to a residential warm air furnace heating installation.

The main circulation fan shown supplies the air circulation through the house both in summer and winter. There is a fan incorporated in the dehydration unit which draws fresh air through a filter and forces this air through the Silica Gel beds. The dried air is then cooled and delivered to the inlet of the main circulation fan where it is mixed with the return air from the house. This mixture, now having the proper moisture content, passes through a cooler where the temperature is lowered to within 5°F. of the tap water temperature. The cooled, dried air then passes through a dry filter and through the furnace and supply ducts to the house. The cooler is of the indirect type, water being circulated through copper tubes and the air in passing over these tubes gives up its heat to the water.

The water which leaves this cooler now flows through a second cooler, in the dehydration unit, where the dried air is cooled. This cooler in the dehydration unit is identical to that in the main air stream and is necessary to remove the heat generated by the condensation of the moisture from the air in the pores of the Silica Gel.

The activation exhaust line carries out to atmosphere the moisture laden air from the bed of Silica Gel which is being reactivated by heat. This activation air-flow is supplied by the fan in the dehydration unit.

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Window *and* Store Display

A NEW window display service has been announced by the American Gas Association—a series of window and store display sets available at modest cost to individual companies. This series has been prepared at A.G.A. headquarters under the supervision of Keith Clevenger, publicity and advertising director, in cooperation with the Window and Store Display Committee of the Commercial Section.

Included in the display material are three backgrounds, some 30 life-size cut-outs of display figures, and 20 miscellaneous display pieces stressing the service features of the appliances exhibited. The backgrounds are 6 feet high, and may be set in from 8- to 16-foot width. They consist of a Dutch tile kitchen background, a bathroom background, and a combination drawing room and basement background.

Subjects scheduled in the series of displays include four gas range and two refrigerator themes, three hot water (bathroom) topics, and five househeating (both furnace and space) displays.

One of the gas range windows is reproduced on this page. "There's Silence When You Make Ice Cream in a Gas Refrigerator" is the title of a display showing two children seated, with plate and spoon in hand, watching a gas refrigerator. Among the hot water subjects is one showing a youngster in a tub, his mother bathing him. This carries the title, "What Chance Has a Feller to Put Off a Bath—When the Hot Water's Always Ready?"

The materials are of durable construction, adaptable to a variety of uses, and may be had at an average cost of $15 per window display. Full details on these accessories, and descriptions of individual window trims, may be had from the American Gas Association.

Arrangements have also been made to supply special copy service for use in gas range advertising. Planographed reproductions of 59 gas cooking advertisements which have appeared in the A.G.A. Art and Copy Service during the past two years have been prepared, together with 24 advertisements of similar theme chosen from gas company copy. Selection of material desired may be made from these advertisements, and matrices of illustrations needed for the copy are available from the A.G.A. This material on ranges has been provided in recognition of the pressing need for general emphasis upon the range load in company advertising. Other educational range material, for direct mail and display use, is also to be had from the A.G.A. Publicity and Advertising department.

Typical window display, using A. G. A. background and cut-outs.

Budget Plan Spreads *the* Cost *of* Heating Service

By RAY TROWBRIDGE

Industrial Gas Engineer
Seattle Gas Company

LAST year Seattle Gas Co. adopted a plan for spreading the cost of gas heating service over the entire year. This answers two purposes: First, it gets the customer in the habit of speaking of the average cost per month of house heating; second, it enables him to pay lower amounts in the winter time than he would otherwise pay and appeals to him around the holidays where normally he would pay high bills. The budget plan gives him more money for Christmas buying.

The budget plan was put into effect in the early summer months in the belief that we should only extend the starting of the plan during summer, under which circumstances the customer would build up a reserve to pay for some of the heavier heating bills during the winter. We found, however, that the customers desired to go on the budget plan in the fall when our heavier heating sales were made and so we changed the plan to meet these conditions and permit the customer to take advantage of the budget system at any time during the year.

At the end of the fiscal year the budget amounts are adjusted and if the customer has overpaid his actual cost of service for the year, we refund the money or give him credit on his account. On the other hand, if he has not paid enough to cover the entire cost of service, he is billed for the balance.

The budget plan may be continued from year to year on the adjusted basis of last year's bills. Going over a number of these accounts where the budget plan was in effect last year, we have

. . SALES PROMOTION DIGEST . .

found in practically every instance that the actual cost was less than we had estimated. In cases where the cost was more than we estimated, the additional amount was only a few dollars. Customers who were on this plan last year are again taking advantage of it, as they found it very attractive and satisfactory.

The form on which this record is kept is illustrated in Fig. 1. It shows the total consumption and total bills, together with the estimated amount for domestic consumption based on the summer months when heating is not normally used. From this, the estimated heating consumption and cost are obtained. We then utilize our degree day weather bureau requirements on the estimated yearly bill and with these facts in mind plot two curves, one on the degree day monthly revenue against the actual monthly bills and the other on the degree day cumulative revenue and the actual cumulative bills.

We are able through these curves to check the customer's expenditures for heating and if we find that he is using too high a temperature as indicated by his use of gas for a particular month, we are able to call his attention to improved ways of operating his system. This keeps us in constant touch with our house heating installations enabling us to know the satisfaction gas heating is giving. We are able to use the customer's name in recommending our service.

This year's customers who are taking advantage of the budget plan will outnumber last year's by probably three to one. We are urging our customers to take advantage of the budget plan when the installation is first signed up so that they will not be faced with a large gas bill right after the job is installed. This is particularly true in the fall months when we sell most of our house heating installations.

BUDGET PLAN RECORD

Name Lt. Col. J. B. Corey Address 2008 1st West Starting Date Nov. 19 30
Est. Annual N.H. $ 160.00 Monthly N.H. $ 13.33 Rate Schedule IH-2-30
" " Dom. $ 44.00 " Dom. $ 3.67 Heat.App. W.H. Boiler
" " Total. $ 204.00 " Total. $ 17.00 Circulating H. F.F.
Dom.App. W.H. X Rge. X
Refrigerator Misc

Estimate based on months from Nov. 1930 to Oct. 1931

No.	Tot.Act.Cons. Cu.Ft.(1)	Rev. $	Est. Domestic Cu.Ft. (2)	Est. $	H. d. D.D. Cu.Ft.(3)	D.D. $	H $ (4)
Dec.	33. 1	21.86	5.7	3.76	27 4	18.10	25 65
Jan.	37. 3	24.43	5.7	3.72	31 8	20.71	25.00
Feb	29. 6	19.23	5.7	3.64	22 9	15.52	21.40
Mar	29. 1	19.58	5.7	3.82	23.4	15.70	20.50
Apr	26. 3	17.62	5.7	3.86	20.6	14.01	15.20
May	16. 8	12.55	5.7	4.18	11.1	8.12	10.45
June	10. 2	10.87	5.7	4.36	4.1	4.41	5.20
July	8. 3	9.86	5.7	4.68	2.6	1.84	
Aug	4. 8	8.81	4.8	3.81			
Sept	6. 6	4.86	5.7	4.80	9	66	6.00
Oct	13. 9	10.65	5.7	4.37	8.2	6.26	12.95
Nov	23. 5	17.40	5.7	5.00	10.8	13.57	18.74
Total	244. 5	168.41	67.5	47.68	170.8	120.50	159.27

(1) Total monthly consumption and revenue from Records Department.
(2) Est. Cons. and revenue (monthly) for Dom. use.
(3) Est. monthly cons. and rev. for House Heating use ave.rate from total consumption.
(4) Degree Day per cent House Heating.
(5) Plot in Red. Cumulative H.N. against DD figures.
(6) Plot in Blue monthly H.N. against Black DD figures.

Remarks: Heating estimate $160.00 overestimated $30.45 first year.
Budget $204.00 overestimated $30.59 first year.
Domestic consumption based on average of August and September
Solid line shows monthly and cumulative degree day costs.
Line shows actual monthly costs. Line shows actual cumulative costs.

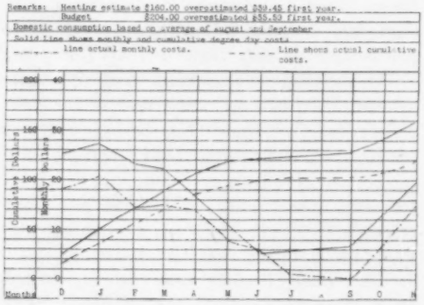

Fig. 1

Service After Sales Holds *the* Domestic Load

By WALTER H. HOAGLAND

Kentucky-Tennessee Light and Power Company, Bowling Green, Ky.

AT the Eastern Natural Gas Sales Conference, conducted in Pittsburgh by the American Gas Association, February 25-26, an outstanding paper was that by Mr. Hoagland. The author deals frankly with faults common to gas utility sales practice, and indicates the directions in which changes are needed. Due to limited space, his remarks are briefed below, and the section on holding the water heater load is deleted.—*Editor.*

REVIEWING some of our current sales practices let us take the gas range. Most new business departments, including my company's, set up an annual forecast of new business sales in dollar volume. In this forecast we set, say two range campaigns, one in March and one in September. When these times come, we concentrate and try to make our quota. In some cases we even employ extra men, part time men. We almost break our necks to get that quota. When the campaign is over we have either exceeded or approached our quota. Isn't it true that the gas ranges are immediately forgotten—even as to whether or not the ranges which have been sold are properly installed and properly adjusted? It has been my experience that 50 per cent of the best known oven heat regulators require adjustment, upon being set in the customer's home. This is not to be construed as a complaint against heat control manufacturers. In most cases uncontrollable conditions of shipment, and rough handling of crated gas ranges are to blame.

In the sale of water heaters, most new business managers place enough confidence in their appliance salesman to select the proper size of storage tank and if an order comes in for a water heater, the chances are pretty good the customer will get the size that was sold to him. But should we not make some exact ruling as to the limits that a certain size water heater can be sold in supplying hot water? Have our salesmen been competent to actually tell with reasonable accuracy, just what is the cost of operation of a certain size water heater? Our competitors will tell you right down to the last kilowatt. On some properties instantaneous heaters are pushed as much or more than storage types. Have we decided for our salesmen when to sell an instantaneous heater and when to sell an automatic storage heater? Is care exercised in seeing that the appliance is burning properly after it has been installed?

If house heating is to expand as it should, estimates that are too conservative must not be tolerated. Many house heating installations, both central-designed and conversion, should not have been placed on the company's mains, due to undersize radiation or improper installation of the means of conveying heat from the heating plant to the rooms to be heated.

We have to face those facts about our present method of selling today. We must eliminate high pressure selling in our industry, and correct the inadequate service in installing new appliances by service men. This responsibility, in my opinion, rests with the New Business Department, and not with the company's service department. Our salesmen are not following their sales with regular follow-up calls and reporting these calls to their superiors. We have no one source of authority to select proper merchandise with respect to size. No one has authority to refuse to accept an order for equipment which it is reasonably certain will not be satisfactory, or

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presents a hazard in the home. New business managers have not attempted to sell employees first. Many employees are not gas consumers, not gas conscious.

Our company has welcomed the attempt by our new business department to conduct a training school for all employees, particularly appliance service men, in order that they might learn the proper adjustments of all appliances. These meetings are held once a week for various groups. In most cases the sales floors were used in the evenings. It is important that all salesmen be taught how to adjust appliances on our properties. Some companies oppose this policy, but I firmly believe that a salesman carrying spud wrench, a screwdriver and a pair of pliers, when properly trained saves the service department time and money.

With every sale of a gas range (or water heater) a letter goes out to the customer signed by the salesman (not the district manager, because it is entirely possible for the customer not to know the district manager). We use a well mimeographed letter and fill in the customer's name. This letter is of the "thank you" type. The same letter cannot be used in all properties, as it must bear local color of the surrounding community. Two weeks later, a second letter is sent out inviting complaints if there are any. This letter serves two purposes. It checks up on the salesman who should have made his follow-up calls. And the customer appreciates receiving this letter. It tends to stop her from talking if she has a complaint. It has good will involved; most of us overlook the fact that the only mail received by the public from us today consists of bills for fuel and letters soliciting the purchase of our investment securities.

According to our plan, there must be three definitely important steps which must be considered to successfully close (and hold) a house heating job.

The first is a predetermination of your actual competitive costs.

The second step in our selling plan is to determine for ourselves what type of equipment the prospect should have.

Thus the house heating survey is one of the most important parts of holding the house heating load. Accurate records must be made of the plans of the house to be heated, for this survey is to be your record of how carefully you have calculated your heat losses.

The size of the heating plant must be

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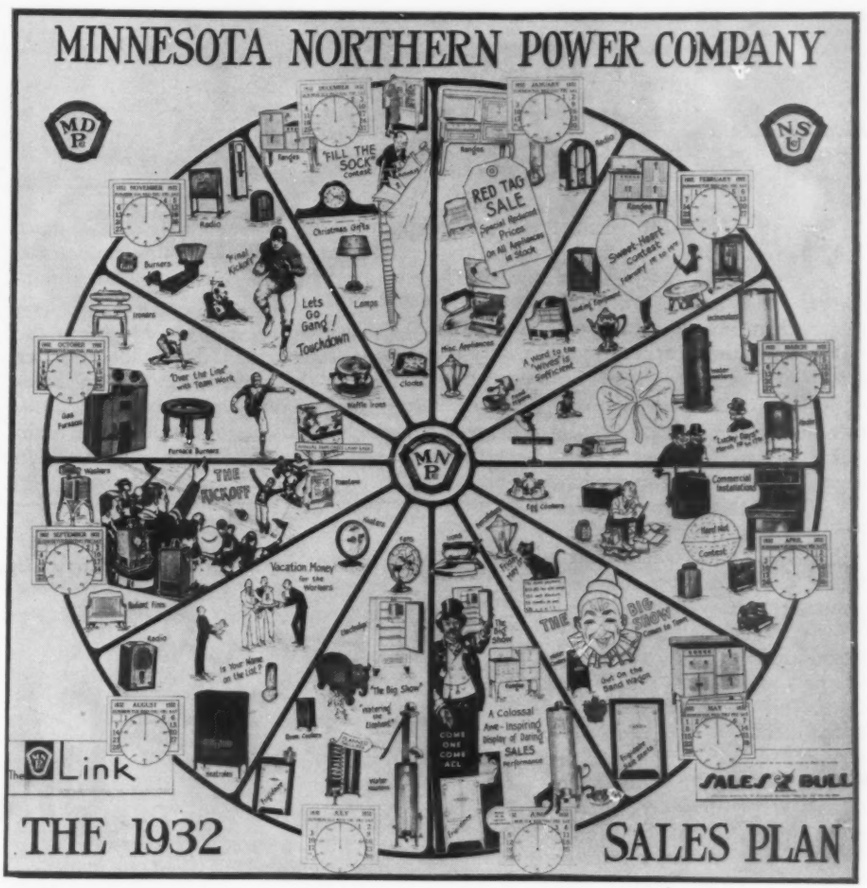

Make *the* Sales Plan Graphic . . .

SALES managers on the lookout for graphic ways to set up their merchandising programs may be able to put to use an idea developed by A. E. Schwarz, commercial manager of the Minnesota Northern Power Co. The unique sales chart shown above was produced for the new business departments of the Minnesota Northern system, each division sales manager being given one of the charts as an inspiration to greater sales effort in 1932. Mr. Schwarz provides the following formula for the chart's composition:

A circle, 36 inches in diameter was laid out on a large card and divided into 12 equal segments. Cut-outs of the various appliances were pasted on in their correct month space, as were also traditional symbols of the months—for instance, along with shamrocks and corn cob pipes in the March division were placed pictures of water heaters and incinerators. In February, hearts and gas ranges announced a "Sweetheart Contest" February 1 to 14, while the Christmas motif is brought out with a stocking, and the featuring of the "gift theme." A photostat was made to 18 inches by 18 inches after the cut-outs were pasted on, and the photostat hand colored. This was then mounted on a board, sprayed with transparent duco and framed with *passe partout*.

The circles placed on each of the 12 monthly calendars are for the purpose of keeping track of the sales for the month; for example: if 60 per cent of the sales quota is made, a line is drawn from the dot in the center to the "60," the space from zero to the line at "60" is filled in with red pencil. If more than 100 per cent of the quota is filled, for example, 110 per cent, the space from zero to 10 is filled in with a blue pencil, the remainder of the circle with red.

Making *a* Rate Change Pay . . . . . .

By FRED C. FOY

Assistant General Manager
Seattle Gas Company

MAKING a rate change is a process nearly every utility operator has been through not once but several times in the course of his experience. But making a rate reduction and at the same time extracting from it the utmost in public appreciation of its significance in sustained or even increased revenues and merchandise sales is a process that has not always had the careful organization and study we have given to other phases of gas property operations.

So, last fall, when Seattle Gas Co. decided to lower its domestic rates materially in Seattle, we started early in our calculations to study the matter of how best to "sell" those rates, and the Seattle Gas Co. with them, to the people we served.

Of course, the rates themselves were designed, among other things, to give Seattle residents a rate for gas service for automatic water heating that would enable them to enjoy this completely modern and up-to-date gas heated service at a money savings over the widespread competition we experience in the Northwest from cheap fuel oil heating, one cent electric cooking, furnace coils and the eight mill electric rate for off-peak water heating. A further feature of the rates was that gas cooking, used in conjunction with automatic water heating, became eligible to the same low cost gas we were offering for water heating and house heating or refrigeration.

In short, whereas previously it has taken a substantial block of gas house heating to qualify the gas user for low cost gas service, under the new set-up an automatic water heater installation serves as the open sesame to gas averaging as low as 1.6 cents a unit under the therm rates, equivalent to 70 cents a thousand cubic feet. Used for storage water heating and cooking, gas at this price is more economical than any of the competitive fuels available in Seattle for these purposes.

Arrived at the answer to where the reduced rates would be established, we started on the question of how to introduce them to our customers in a manner that would pay us maximum returns in three ways; aroused public interest in gas service and its value in the home, stimulated merchandise sales and their attendant increase in gas consumption and finally, if possible, sufficient increased consumption of gas itself to offset the estimated revenue drop occasioned by the cut in rates.

For some time officials of our parent company, the Central Public Service Corp. of Chicago, had been watching the newly established "therm rates" of the Peoples Gas Light and Coke Co. of Chicago and before that had been speculating on the therm rates used by English gas companies since 1920. There seemed certain decided advantages of establishing rates on a thermal basis from the operating standpoint, but more than that from the sales and publicity standpoint a change to a therm basis was a "natural" as the saying goes.

Accordingly, we decided to make the change to a therm basis at the same time we offered our customers and the people of Seattle lower rates for gas service. And the planning started.

Our advertising department, working with our advertising agency, the J. Walter Thompson Co., started the preparation of a series of advertisements designed to tell the public not only that the new therm rates we were offering were lower than our previous rates for domestic service, but of what the new therm basis consisted.

A rate reduction in itself is news of interest to people generally, but a rate reduction coupled with a change to a new gas service measurement basis proved the basis for a strong campaign with a built up news interest of scientific and sales background. Home economics and physics experts of the Washington State Normal Schools and the University of Washington were called in to

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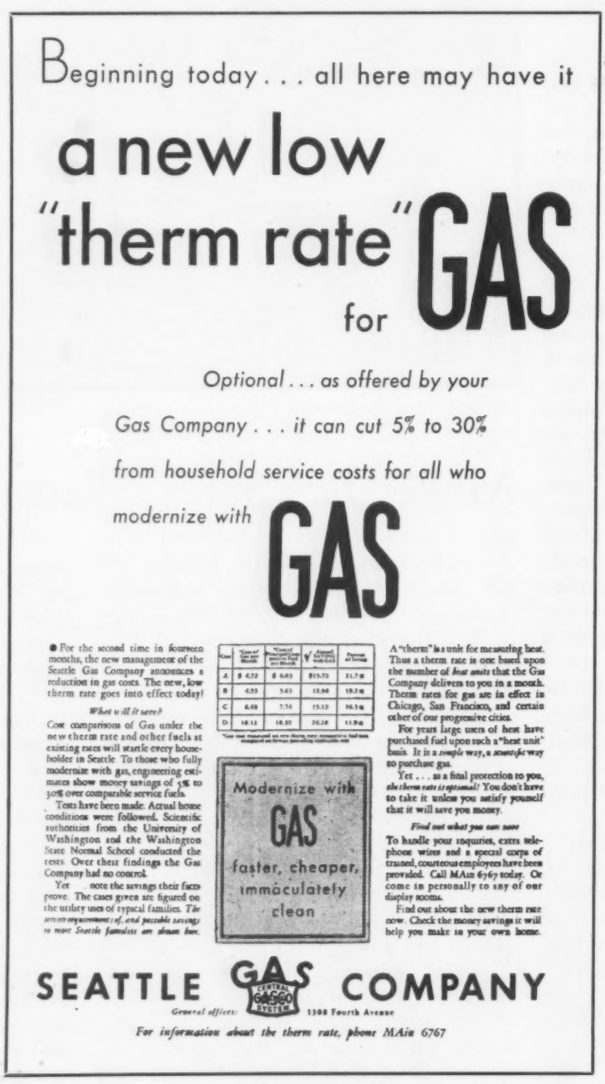

Beginning today . . . all here may have it

a new low "therm rate" for GAS

Optional . . . as offered by your Gas Company . . . it can cut 5% to 30% from household service costs for all who modernize with GAS

● For the second time in fourteen months, the new management of the Seattle Gas Company announces a reduction in gas costs. The new, low therm rate goes into effect today!

What will it save?

Cost comparisons of Gas under the new therm rate and other fuels at existing rates will startle every householder in Seattle. To those who fully modernize with gas, engineering estimates show money savings of 5% to 30% over comparable service fuels.

Tests have been made. Actual house conditions were followed. Scientific authorities from the University of Washington and the Washington State Normal School conducted the tests. Over their findings the Gas Company had no control.

Yet . . . note the savings their facts prove. The cases given are figured on the utility uses of typical families. *The service requirements of, and possible savings to, your Seattle families are shown here.*

Case	Kind of Month	Normal Therms Used in Month	Normal Monthly Bill	Therms Used with Gas	Percent of Saving
A	F	4.52	$ 6.83	$15.72	11.7%
B		6.55	9.63	13.66	19.2%
C		6.48	7.74	15.12	16.5%
D		16.12	18.37	26.28	11.9%

Case rates measured on new therm rate; comparative fuel rate computed on former prevailing applicable rate

Modernize with GAS faster, cheaper, immaculately clean

A "therm" is a unit for measuring heat. Thus a therm rate is one based upon the number of *heat units* that the Gas Company delivers to you in a month. Therm rates for gas are in effect in Chicago, San Francisco, and certain other of our progressive cities.

For years large users of heat have purchased fuel upon such a "heat unit" basis. It is a *simple* way, a *scientific* way to purchase gas.

Yet . . . as a final protection to you, *the therm rate is optional!* You don't have to take it unless you satisfy yourself that it will save you money.

Find out what you can save

To handle your inquiries, extra telephone wires and a special corps of trained, courteous employees have been provided. Call MAin 6767 today. Or come in personally to say of our display rooms.

Find out about the new therm rate now. Check the money savings it will help you make in your own home.

SEATTLE GAS COMPANY

General offices: 1308 Fourth Avenue

For information about the therm rate, phone MAin 6767

A sample of the newspaper advertising copy used by Seattle Gas Co. in publicizing its rate change.

Pacific Coast Gas Association

Managing Director: Clifford Johnstone

Association Headquarters: 447 Sutter St., San Francisco

President: Jas. L. Stone

Vice-President and Gen. Manager, Spokane Gas and Fuel Co.

Committees Start Final Drive

WITH the Mid-Winter Conference well behind them, the Association committees are busy assembling data to be included in their final reports. Section chairmen have issued notices that all reports should be completed and turned in by about May 15 so there is but little more than 30 days remaining. There are on this page some additions and changes in committee memberships not heretofore reported.

The complete organization of the Accounting Section is as follows:

Accounting Section Committees

C. D. Cushman, chairman, Los Angeles Gas and Electric Corp.
R. N. Dreiman, vice-chairman, Standard Management and Operating Corp.
B. H. Hoke, vice-chairman, Spokane Gas and Fuel Co.

Merchandise Accounting

H. M. Riehle, San Diego Consolidated Gas and Electric Co., chairman.
J. A. Brice, British Columbia Electric Railway Co., Ltd.
A. B. Cates, Southern California Gas Co.
W. J. McCoy, Southern Counties Gas Co.
C. W. Platt, Portland Gas and Coke Co.
Pierre Vinet, Coast Counties Gas and Electric Co.

Accounting in Connection with Auxiliary Motive Equipment

A. S. MacDougall, Los Angeles Gas and Electric Corp., chairman.
H. V. Buffington, Los Angeles Gas and Electric Corp.
W. D. Chambers, San Diego Consolidated Gas and Electric Co.
Bert Embry, Southern California Gas Co.
Gus Hamilton, Southern Counties Gas Co.

Purchasing and Stores Accounting

J. Q. Ewing, Southern California Gas Co., chairman.
C. W. Cropp, British Columbia Electric Railway Co., Ltd.
Wm. Evans, L. A. Gas and Electric Corp.
Wm. Giese, Southern Counties Gas Co.
J. G. Hawkins, Portland Gas & Coke Co.
John Zimbleman, San Diego Consolidated Gas and Electric Co.

Preservation and Destruction of Records

E. C. Cox, Southern Counties Gas Co., chairman.
N. H. Bradshaw, Los Angeles Gas and Electric Corp.
W. E. Cook, Spokane Gas & Fuel Co.
G. A. Detrick, Southern California Gas Co.
L. R. French, San Diego Consolidated Gas and Electric Co.
Ralph Henderson, Coast Counties Gas & Electric Co.
Geo. F. Mackenzie, Portland Gas & Coke Co.

Fixed Capital Records

S. W. Binckley, Southern California Co., chairman.
M. E. Bauman, Los Angeles Gas and Electric Corp.
O. A. Honey, Southern Counties Gas Co.
W. C. F. West, Los Angeles Gas and Electric Corp.

Natural Gas Classification of Accounts

R. A. Hornby, Pacific Lighting Corp., chairman.
E. N. Simmons, Los Angeles Gas and Electric Corp.

Commercial Section Committees

Load Value of Appliances

H. W. Geyer, chairman, announces that L. J. Brundage, Pacific Gas and Electric Co.; W. P. Hand, Southern California Gas Co.; and L. C. Rausch, Montana Power Co., have accepted membership on the committee.

Air Conditioning

H. L. Warren, chairman, announces the membership of the committee as follows:
C. E. Arundal, Southern Counties Gas Co.
D. S. Kelleway, Portland Gas & Coke Co.
C. B. Patterson, San Joaquin Light and Power Corp.
J. W. Wrenn, Pacific Gas and Electric Co.

Overhead Unit Space Heaters

J. H. Hill, Pacific Gas and Electric Co., has been appointed chairman of this committee replacing S. E. Runser, resigned.

Technical Section Committees

Compressor Stations

B. E. Embry, Southern California Gas Co., has accepted membership on this committee.

Servicing of Special Installations

W. F. Pape, chairman, announces the appointment of C. A. Thorp, Los Angeles Gas and Electric Corp.; H. W. Geyer, Southern Counties Gas Co.; and J. N. Young, Pacific Gas and Electric Co., to membership.

Governors and Regulators

Wm. A. La Violette, chairman of this committee, gives its complete membership as follows:
H. G. Andrews, Southern California Gas Co.
Otto Boyd, Southern California Gas Co.
W. H. Davis, Pittsburgh-Equitable Meter Co.
F. English, Pacific Gas and Electric Co.
Otto Goldkamp, San Diego Consolidated Gas and Electric Co.
E. H. Hammond, Neilan Co., Inc.
Henry Harris, Los Angeles Gas and Electric Corp.
D. S. Kelleway, Portland Gas & Coke Co.
J. V. Thomas, Natural Gas Equipment Co.
W. I. Thrall, Reliance Regulator Corp.
F. H. Winslow, Southern Counties Gas Co.

Domestic Meters

Chairman D. E. Farmer has appointed F. A. Hough, Southern Counties Gas Co., to membership.

Pipe Protection

Chairman O. L. Wrestler announces the following new committee members:
A. W. Flippin, Pacific Gas and Electric Co.
R. L. Hall, British Columbia Electric Power and Gas Co.
Geo. A. Stuart, Seattle Gas Co.
B. A. Williamson, Los Angeles Gas and Electric Corp.

Gas Holder Maintenance

C. P. Johnston, chairman of the Production Committee, announces that D. B. Larson, Portland Gas & Coke Co., has accepted the chairmanship of this committee.

Pacific Coast Trade Relations Study

IN cooperation with the Pacific Coast Electrical Association and the Pacific Coast Electrical Bureau, the Association has undertaken to make a thorough study of trade relations problems as they affect manufacturers, jobbers, retailers and public utilities in the marketing of gas and electric appliances.

The study will be directed by a joint committee headed by F. M. Banks, general superintendent of sales of the Southern California Gas Co. and chairman of the Commercial Section of the Pacific Coast Gas Association. Working with Mr. Banks will be H. M. Crawford, general sales manager of the Pacific Gas and Electric Co.; H. C. Rice, manager merchandising department of the Southern California Edison Co.; H. H. Courtright, president of Valley Electric Supply Co.; K. I. Dazey, managing director of the Pacific Coast Electrical Association, and Clifford Johnstone, managing director of the Pacific Coast Gas Association.

This committee has employed C. A.

Swigart as its field representative. Mr. Swigart has an excellent background of public utility and newspaper experience and has been active in the civic affairs of Medford, Oregon, for many years, having served as president of the Chamber of Commerce, school board and Rotary club in the community. His experience also includes distribution of appliance lines on the west coast.

Mr. Swigart has already commenced his activities, working directly under K. I. Dazey, managing director of the Pacific Coast Electrical Bureau. Mr. Swigart's headquarters will be at 447 Sutter Street, San Francisco.

Association Membership

In common with other trade associations, the Pacific Coast Gas Association has suffered some loss in membership this year. The loss is, however, very small in comparison with most associations and the membership can easily be brought back to its peak by a little missionary work.

For the balance of the present fiscal year new individual members can join the Association for $2.50. Other memberships are also reduced by 50 per cent. There is no initiation fee.

Mfgr.'s Section Executive Committee Meeting

Chairman R. L. Hinckley presided at a meeting of the Executive Committee of the Manufacturers' Section which was called in Los Angeles on March 10 to consider the report of the managing director, Clifford Johnstone, who had attended the Chicago meeting of the Manufacturers' Section of the American Gas Association. John H. Sattler of Gaffers & Sattler also attended the Chicago meeting and rendered a report on the impressions he received there.

Appliance Society Plans Range Campaign

ANOTHER big spring drive on gas ranges has been laid out, all plans are completed and from April 11 to 16, the Gas Appliance Society of California will embark on its annual gas range week. The success of these campaigns throughout northern California in the past encourages the executive committee to feel that the results of the 1932 campaign will compare favorably with those held in previous years.

To assist the dealers in utilizing to the utmost the public interest that will be created by an extensive campaign of publicity, posters, street car cards and radio, the Board of Directors of the State Society has made two specific recommendations which, if followed by the dealers, will give a uniform aspect to the campaign over the entire territory.

The recommendations are:

(1). That the special campaign offer of an oven heat regulator free will be made only during the campaign week and the Saturday preceding it, and will be applicable only to kitchen heater types regularly selling for a net cash price of $116 or more, and straight gas types regularly selling for a net cash price of $96 or more.

(2). That there be no mention of specific terms or length of payments in the advertising during the spring gas range campaign and that no additional premiums be given away other than the oven heat regulator.

As in past drives of this kind, the society will provide local dealers with colorful window display posters and heavy cardboards, size 21 inches x 27 inches, bearing the message, "This Week Only. You Can Save $16.00 on a Gas Range." Similar posters have been prepared for use on the dashboards of street cars in San Francisco and the East Bay District, and material has been made available for other units of the society desiring to cooperate in this advertising.

Radio broadcasting also has been enlisted, and at frequent intervals during the week, appropriate sales messages will be broadcast.

From the headquarters of the Gas Appliance Society in San Francisco are issuing publicity releases, which in past years have been used to the extent of thousands of column inches. Inasmuch as a novel motive has been created for this year's material, it is expected that it will meet with favor at the hands of the press.

This year's publicity is being developed around the names and photographs of famous motion picture stars. Many of the great personalities of the screen have been photographed in their kitchens, and press agent releases quote their favorite gas-cooked recipes.

Dealers who are alive to the possibilities of the campaign will secure free of charge mats of the oven heat regulator made from a composite sketch of most poupular types of regulators, as well as mats of the Gas Appliance Society seal.

To further encourage the use of window displays, a window trim contest will be held, and for the most attractive display featuring gas ranges during the campaign week, $20 and $10 prizes will be awarded. An impartial committee from the experts of the San Francisco Advertising Club will judge the entries.

Manufacturers and jobbers are all cooperating in furnishing dealers with various sales aids, literature and envelope stuffers, and the entire appliance industry of northern California is preparing to cooperate with the public utilities to the end that 1932 may be remembered as a banner sales year.

Second San Francisco Line Gets Under Way in March

Preliminary construction operations are under way on the second feeder line into San Francisco, Calif., supplying that city with natural gas from Kettleman Hills. Pacific Gas and Electric Co. reports that the line will consist of 45 miles of 26-inch pipe and will cost approximately $1,870,000 with completion scheduled for six months hence.

Starting at the San Mateo-San Francisco line near the intersection of Alemany and Junipero Serra boulevards, the new line will follow the Skyline boulevard to a point west of Palo Alto, from there it will run to a point near the Sunnyvale airship base and thence through Alviso to the Milpitas metering station, joining the main Kettleman-Milpitas carrier.

Seven miles of the line in the San Francisco city limits are now nearing completion.

1932 Calendar

April

Distribution Conference — American Gas Association Technical Section, Ninth Annual Convention, Tutwiler Hotel, Birmingham, Ala., April 6-8, 1932.

Mid-West Gas Association—Annual Convention, St. Paul Hotel, St. Paul, Minn., April 11-13, 1932.

Missouri Association of Public Utilities—Annual Convention, Elms Hotel, Excelsior Springs, Mo., April 28, 29 and 30, 1932.

Southern California Meter Association—Los Angeles, Calif., April 28, 1932.

May

Southern Gas Association—Annual convention, Monteleon Hotel, New Orleans, La., May 3-4-5, 1932.

Natural Gas Department, American Gas Association—Annual Convention, Tulsa, Okla., May 9-11, 1932.

National Fire Protection Association—Atlantic City, N. J., May 9-12, 1932.

June

Canadian Gas Association—25th Annual Convention, Fort Garry Hotel, Winnipeg, Manitoba, Can., June 9 and 10, 1932.

July

Michigan Gas Association—Annual Convention, Grand Hotel, Mackinac Island, Mich., July 5-7, 1932.

August

Pacific Coast Gas Association — Thirty-ninth Annual Convention, August 23-26, 1932.

October

American Gas Association—Annual Convention, Atlantic City, N. J., October 10-14, 1932.

Pittsburg Water Heater Co. Moves Its San Francisco Offices

Pittsburg Water Heater Co., under the management of Charles Aaronson, has recently announced the removal of its headquarters from 478 Sutter St., San Francisco, to 898 Van Ness Avenue. The company has been located at the Sutter Street address for the past 17 years, and the new move to more spacious quarters is in line with a program of expansion.

Metropolitan Tulsa's skyline will be a familiar sight to convention goers.

Program Details Released for Tulsa Meetings

FINAL plans for the Annual Convention of the Natural Gas Department of the American Gas Association, to be held this year at Tulsa, Okla., May 9, 10 and 11, are being completed, a tentative working program having been released by A. E. Higgins, secretary of the Department. T. J. Strickler, vice-president and general manager of the Kansas City Gas Co., Kansas City, Mo., is chairman of the Natural Gas Department of the A. G. A.

T. J. Strickler

All convention sessions will be held in the Crystal Ball Room of the Mayo Hotel, the first session beginning at 2 p.m. on Monday, May 9, several pre-convention committee meetings also having been planned for that day. A joint meeting of the sub-committee on Code for Testing Natural Gas for Gasoline Content and a committee of the Natural Gasoline Association of America will be held Monday morning, May 9. The main technical and research committee and sub-committees will meet in the private dining room of the hotel on Monday morning.

Registration of delegates, of which it is estimated there will be about 1,500, also will be taken care of Monday morning.

The annual meeting of the executive, managing and advisory committees will convene in the French room of the Hotel on Monday evening, May 9, for a dinner and business session.

On the Tulsa general session program will appear the following features:

Monday Afternoon, May 9

Opening Remarks—T. J. Strickler, chairman, Natural Gas Department, A.G.A.

Invocation—Dr. C. W. Kerr, Pastor, First Presbyterian Church, Tulsa, Okla.

Address of Welcome—Mayor of Tulsa.

Address—E. A. Olsen, president, Oklahoma Natural Gas Corp., Tulsa, Okla.

Address of the Chairman—T. J. Strickler, vice-president, Kansas City Gas Co., Kansas City, Mo.

Appointment of Committee on Chairman's Address—L. K. Langdon, vice-chairman, Natural Gas Department.

Address—R. W. Gallagher, president, American Gas Association.

Address—Alexander Forward, managing director, American Gas Association, New York.

"This Changing World"—A talk on oil, gas and the banks, their relation to public welfare—Walter F. Ferguson, vice-president, Exchange National Bank, Tulsa.

Informal Addresses by Gas Company Executives.

Tuesday Morning, May 10

Appointment of Committee on Final Resolutions—T. J. Strickler, chairman, Natural Gas Department.

Dealer Cooperation, the Need and Justification for Utility Selling—LeRoy M. Edwards, general counsel, Southern Counties Gas Co., Los Angeles, Calif.

Dealer Cooperation by Affiliated Associations—A. E. Bettis, president, Missouri Association of Public Utilities, Kansas City, Mo.

Report of Main Technical and Research Committee and Sub-Committees—H. C. Cooper, chief engineer, Hope Natural Gas Co., Pittsburgh, Pa.

Developing New Uses for Gas and the Need for Such Accomplishment—Henry O. Loebell, vice-president, Combustion Utilities Co., New York.

Tuesday Afternoon, May 10

General Condition in the Industry—E. B. Reeser, president, Barnsdall Oil Co., Tulsa, Okla.

Rate Legislation and Taxes—Judge H. O. Caster, Henry L. Doherty & Co., New York.

Large Diameter Transmission Lines—E. F. Schmidt, general superintendent, Lone Star Gas Co., Dallas, Texas.

Water Vapor in Natural Gas—C. H. M. Burnham, chief engineer, Colorado-Wyoming Gas Co., Denver, Colo.

Wednesday Morning, May 11

Wrinkles—H. J. Hoover, Natural Gas, Cincinnati, Ohio.

Report of Committee on Supply Men's Fund—J. B. Tonkin, vice-president, Peoples Natural Gas Co., Pittsburgh, Pa.

Latest Developments in Production—H. A. Wallace, president United Fuel Gas Co., Charleston, W. Va.

Conservation of Gas in Completion of Well Drilling and Gas Well Deliveries—N. C. McGowen, president, United Gas Public Service Co., Houston, Texas, and E. L. Rawlins, natural gas engineer, U. S. Bureau of Mines, Bartlesville, Okla.

General Utility Situation—J. F. Owens, president, National Electric Light Association, Oklahoma City, Okla.

Motion Picture of Roumania's Burning Well—M. M. Kinley, Kinley Brothers, Tulsa, Okla.

Wednesday Afternoon, May 11

Major Future Sales Problems—Samuel Insull, Jr., vice-chairman, Middle West Utilities Co., Chicago, Ill.

Dehydration and Oil Fogging—R. M. Redding, general superintendent, Dallas Gas Co., Dallas, Texas.

Question Box and Discussion—J. D. Creveling, Henry L. Doherty & Co., New York.

Report of Committee on Chairman's Address.

Report of Committee on Final Resolutions.

Final Business and Closing Remarks.

An interesting program of entertainment has been planned, beginning with a barbeque scheduled for 6:30 p.m. at the Tulsa Country Club on Monday, followed by an informal dance. A bridge luncheon for convention ladies will be held in the Mayo Hotel on Tuesday, May 10, and on Tuesday at 7:30 p.m. a cabaret banquet and dance will be held in the Crystal Ball Room of the hotel. There will be no speakers, and the entertainment committee has planned an unusual vaudeville entertainment for the occasion.

Line Route for Columbus, Neb. Extension is Changed

The routing of Northern Gas and Pipe Line Co.'s extension to serve Columbus, Neb., has been changed, and the line as now planned will leave the existing system at David City, extending north toward Schuyler, crossing the Platte River and extending on to Columbus. The 6-inch main of the company will end at a border station which will be erected on the property owned by Central West Public Service Co., east of 12th Avenue, Columbus. There the gas will be reduced to 35-pounds pressure and metered into the Central West company's mains. The gas will also be odorized at that point. The distribution company is constructing a belt line to carry the new gas to all mains and is eliminating all dead ends. Gas service is expected about May 1, according to Harry S. Thompson, manager for the company at Columbus.

Gas Service Salesmen Meeting Quotas In Spring Water Heater Campaign

ON FEBRUARY 29, all Gas Service Co. new business departments, under F. M. Rosenkrans, new business manager, began an intensive automatic storage water heater campaign, with a goal of 1,200 water heaters to be sold throughout the company's system in Kansas and Missouri by the first of May. At the same time, salesmen will continue to offer the group sales plan announced on February 1, and will also continue work during the month of March on the special sale of house heating burners. A special range sale by Gas Service units ended on February 29.

It was reported on March 15 by Gas Service Co. that during the first two weeks of the water heater campaign, 200 automatic storage heaters had been installed, or more than 16 per cent of the 1,200 quota. The new business department of the Wyandotte County Gas Co., Kansas City, Kan., under Jack Torbert, was leading the group at that time with 38.9 per cent of its quota sold. Salesmen of the Parsons, Kan., office were second with 36 per cent of the quota sold, and Arkansas City, Kan., men were third with 28 per cent.

Information on the campaign is printed in the Daily News "Hot from the Spigot," being published every other day for the duration of the campaign, and circulated to new business managers. The news sheet gives the results obtained in all districts and once each week prints the standing of each salesman for the entire company.

Various plans are being used in the individual companies of the system. Both the Kansas City Gas Co., Kansas City, Mo., and the Wyandotte County Gas Co., Kansas City, Kan., are printing circulars which are given out by the meter readers on their rounds. The Capital Gas and Electric Co., Topeka and the St. Joseph Gas Co., St. Joseph, Mo., have mailed out post cards to a selected mailing list, telling of the campaign. Meter readers in some of the properties are carrying memoranda blanks which are filled out for any appliance in which a customer is interested.

One feature of major importance in the campaign is the employee cooperation being demonstrated. The personnel of all companies, from office boys to general managers are on the look-out for prospects. Jack Torbert, new business manager for the Wyandotte County Gas Co., reports that employees of the commercial and operating departments have been especially active in turning in names of live prospects. The quota of this company for all appliance sales during the month of March was $8,000, and before the 15th, $5,000 worth had been chalked up. Mr. Torbert attributed much of the success of his company to general employee cooperation.

A 20-gallon, completely automatic water heater selling for $54.50 was selected as the *piece de resistance* for the 2-month campaign. This model is being especially featured, while two larger storage systems are also being advertised, a 30-gallon, selling for $65 and a 40-gallon for $87.50.

Reporting on the range sales campaigns which lasted from February 15 to February 29, the Gas Service organization installed 97 ranges in the 14 days. Kansas City Gas Co., Kansas City, Mo., was first, with 31 ranges to its credit; Wyandotte County Gas Co., second, with 23, and St. Joseph Gas Co., St. Joseph, Mo., third, sold 22 ranges.

Illinois Northern in Expansion Program

ILLINOIS NORTHEN UTILITIES CO., headquartered at Dixon, Ill., has completed its line from the manufactured gas plant at Dixon to serve Polo, Mt. Morris and Oregon, Ill., the line totaling 25 miles of 4- and 3-inch pipe. The 4-inch main extends northward from Dixon, and a 3-inch lateral branches westward to Polo. The 4-inch main continues north and east to a point directly south of Mt. Morris, and from there two 3-inch laterals extend to Mt. Morris and Oregon. The pipe is steel with welded joints and is covered with a protective coating.

At the time of the original solicitation for customers, approximately 700 signed for service. At the present time over 700 meters have been installed and it is estimated that by August 1, 1932, approximately 1,000 customers will have been connected.

The extension of gas service to these towns has necessitated some changes and additions to the operating personnel. Each town has a population of about 2,000 and had been served with electricity by Illinois Northern for several years. Offices had been established in Oregon and Polo at the time electric service began. With the installation of gas service three employees were given training in gas utility work and one is now serving in each town as local manager. A new office has been established in Mt. Morris.

The company is expecting to begin service in Amboy, Ill., in the near future, supply to come from wells near Maytown, approximately 9 miles south of Amboy. The wells are owned by E. Stevenson, and Mr. Stevenson has the contract to construct the transmission line to the city limits of Amboy. The franchise at Amboy, granted to Illinois Northern recently, covers a period of 25 years. Service is expected in the late spring months.

Line to Serve Detroit, Mich., Planned

THE proposed line to Detroit, Mich., reported to be planned by United Light & Power and the Columbia interests, will probably take off from the Panhandle Eastern Pipe Line Co.'s carrier at Rockville, on the Illinois-Indiana border, extending to Detroit in a northeasterly direction. The length of the line under this plan would be approximately 300 miles.

Take-off could also be made from the Columbia system at Muncie, Ind., which would necessitate construction of a 200 mile line. The former route is reported as more probable, however, due to the more profitable area through which it would extend. Such towns as Crawfordville, Frankfort, Logansport, Peru, Kokomo, etc., would lie within easy reach of the line were it constructed direct from Rockville to Detroit. Also there is the fact that the present connection between Rockville and Muncie is partly constructed of 18-inch pipe. A bottle-neck would therefore be formed were the 20-inch line built from Muncie.

Although price quotations on 200 and 300 miles of 20-inch pipe were called for by Brokaw, Dixon, Garner & McKee, New York engineering firm, sometime ago, no definite announcements have been made concerning the project, and it is not known when negotiations may be completed. An entirely new company may be formed, it is understood, by the interests involved in the project.

Eugene L. Keating to Manage New Dept. for Seattle Gas Co.

SEATTLE GAS CO., Seattle, Wash., announces creation of another department with Eugene L. Keating at its head as merchandise sales manager. J. Earl Jones is manager of commercial sales in charge of all house heating, commercial industrial and apartment house sales in addition to having special customer contact work. The announcement of the two divisions was made recently by James F. Pollard, general manager.

Eugene L. Keating

Mr. Keating's activities will include supervision of all domestic merchandise sales including ranges, water heaters, refrigerators and auxiliary heaters. He will direct field salesmen, floor salesmen and the arrangement and sale of domestic merchandise on all district sales floors.

Mr. Keating joins the staff of the Seattle Gas Co. with a varied and successful experience in selling. During the past five years he has been merchandise manager in charge of specialty selling for a large chain of department stores in Chicago. This work included the handling of gas household appliances. Prior to that time he spent five years as sales supervisor of gas merchandise for the Illinois Power and Light Corp. Selling in many fields comprised early activities.

Peoria, Ill., Changed Over to "Natural" by Central Ill. Light Co

Natural gas change-over was begun in Peoria, Ill., during the middle of March by the Central Illinois Light Co., the gas coming from a 60-mile lateral from the main line of the Panhandle Illinois Pipe Line Co.

Approximately 200 men, employed and trained for the conversion of appliances, began change-over operations on Saturday, March 12, with completion of the work scheduled for the latter part of the month. Conversion of the systems in Pekin, East Peoria, Farmington, Bartonville, Elmwood, and Yates City, was also part of the program.

Preliminary Operations Begin on Geneseo-Milwaukee Extension

The Natural Gas Pipeline Co. of America, Chicago, Ill., is carrying on right-of-way operations for the Geneseo-Milwaukee extension. It is reported that the line will cross parts of Henry, Whiteside, Lee, Ogle, Winnebago, Boone and McHenry counties of Illinois. The company is reported to be planning ditching operations on the extension as as soon as the ground is thawed out enough to work.

O. J. Shannon

W. F. Wright

Shannon Resigns as Vice-Pres. of Lone Star's Ft. Worth Division

O. K. SHANNON, vice-president of the Lone Star Gas Co., in charge of operations in the Fort Worth division, announced his resignation March 14, effective March 1. Wesley F. Wright, local manager, will be in charge of the Fort Worth division.

Mr. Shannon became vice-president of Lone Star in 1931 when the name of the distribution company was changed from the Fort Worth Gas Co., to Fort Worth Division, Lone Star Gas Co. He had served as president of the Fort Worth Gas Co. since 1926.

In 1909 Mr. Shannon became a member of the company, being elected secretary in October of that year. In 1914 he was made manager and director; in 1918, vice-president and manager; in 1924, vice-president and general manager, and in 1926 he was elected to the presidency. For several years he served as vice-president and director of the Natural Gas Association of America.

Before his entrance into the gas business Mr. Shannon practiced law and in 1905, as secretary of state, affixed his signature to the charter of the Consumer's Light and Heating Co. of Fort Worth, a forerunner of the present gas company.

Possible Line Route for Great Northern Line Announced

Progress is reported on plans for a 580-mile, 24-inch line from eastern Montana fields to Minneapolis and St. Paul, according to John F. Wight, secretary of the Great Northern Gas & Utilities Co. Two routes for the line have been mentioned as within possibility, one from the southern end of the Cedar Creek anticline through Aberdeen and Watertown, South Dakota, to Minneapolis; the other, a longer line, running from the Bowdoin Dome in Montana, through Williston, Minot, Devils Lake and Grand Forks, North Dakota, to Minneapolis, Minn. Mr. Wight reports that additional surveys are being run which may change the routing. The development will cost in the neighborhood of $20,000,000.

Plans of the company for bringing natural gas to Minneapolis were approved on March 15 by the city council. The company is reported to have an open flow of 350,000,000 cubic feet in the Baker-Glendive field.

North Central Gas Co. Ready to Begin Alliance Lateral

Officials of the North Central Gas Co., Casper, Wyo., were in Alliance, Neb., the middle of March, in the interest of the company's franchise application, filed there some months ago. J. M. McIntyre, vice-president and general manager for the company, stated that his company is ready to construct a line from Bridgeport, Neb., to serve the town. It is estimated that about $400,000 would be spent on the gas transmission line and the city's distribution system.

Natural Gas for San Diego by September 1

FINAL negotiations were completed on March 15 whereby San Diego city and county will have natural gas service, with September 1 given as the date for beginning the new service, according to an announcement made by W. F. Raber, president of the San Diego Consolidated Gas and Electric Co. The company now serves manufactured gas in its system, which includes San Diego, La Jolla, Coronado, Pacific Beach, Ocean Beach, Oceanside, Escondido, National City, Chula Vista and San Ysidro.

Construction of the line will be under the direction of Southern Counties Gas Co., Los Angeles. Industrial Fuel Supply Co., affiliated with Southern Counties, will install 10½ miles of 16-inch line to Huntington Beach from Long Beach. Southern Counties will construct 68 miles of 12¾-inch line from Huntington Beach to Rose Canyon, near La Jolla, and San Diego Consolidated Gas and Electric Co. will construct 7 miles of line to San Diego. Overall cost of the project will be $1,700,000.

The transmission line will parallel the Coast Highway, and all communities along the route will be served.

Southern Counties Gas Co. has an assured supply of gas both from the Los Angeles Basin and from Kettleman Hills fields.

A new schedule of rates will be put into effect with the coming of natural gas, tentatively as follows:

For San Diego, Coronado and National City:

First 200 cubic feet or less per meter per month, 90 cents net.

Next 800 cubic feet, 14.5 cents net per 100.

Next 2000 cubic feet, 12 cents net per 100.

Next 7000 cubic feet, 10 cents net per 100.

All over 10,000 cubic feet, 9 cents net per 100.

Territory served by the company outside San Diego, National City and Coronado will have a rate of $1.15 for the first 200 cubic feet, but the other rates will be the same as for the metropolitan area.

Prepayment meters in the entire area served by natural gas lines will have a rate of $2 per 1000 cubic feet subject to a minimum of 90 cents in the metropolitan section and $1.15 outside.

Plans to date have not contemplated service of natural gas to Escondido, which is not supplied from the local generating plant.

The company's manufactured gas plant will be held in readiness as stand-by service, and the 9,000,000 cubic feet of storage capacity will be used for natural gas storage.

The present storage capacity of 75,000 gallons of butane, used for enriching purposes, will be increased to 225,000 gallons in the near future, for use with the oil gas as stand-by service.

Preparations are getting under way for the change-over from 550 B.t.u. to 1100 B.t.u. gas, a force of approximately 400 men being schooled for the work.

In order to familiarize its customers with the new fuel, the company is preparing a series of informational advertisements on the subject "Get Ready for Natural Gas." As planned, these advertisements will carry a dual message, one of an informational nature, the other a sales appeal.

Hannibal-Quincy Line Gets Under Way

PANHANDLE EASTERN PIPE LINE CO., Kansas City, Mo., is now beginning operations on the 25-mile, 10-inch line from Hannibal, Mo., to serve Quincy, Ill. A 5-mile lateral will also be extended to Palmyra, Mo., from the new line.

The new 10-inch carrier will leave the Hannibal line several miles west of Hannibal and extend almost directly north to the Mississippi river near the South River in Marion County. At that point two lines of 8-inch pipe will be placed on the bed of the Mississippi to take the gas across the state line into Illinois. The two 8-inch lines crossing the Mississippi will be approximately 3,300 feet long, and will be placed in a 6-foot trench in the bottom of the river silt. River clamps weighing 2,500 pounds will be fastened on the pipes 100 feet apart.

From Marblehead, Ill., a line will be run by the Panhandle Illinois Pipe Line Co., to Quincy and will connect with the lines of the Central Illinois Public Service Co., now serving manufactured gas in that city. The gas for the Quincy will be odorized at the city gate, where a metering and regulating station is to be constructed.

In Palmyra the gas will be distributed by the Central States Gas Utilities Co., subsidiary of Panhandle Eastern Pipe Line Co.

John T. Clancy, Worthington Executive, Dies Suddenly

John T. Clancy, an executive of Worthington Pump and Machinery Corp., died suddenly of a heart attack, March 9, while lecturing at the Engineers' Club, New York City, before a meeting of the American Society of Mechanical Engineers.

Mr. Clancy was born in New Brunswick, N. J., in 1890. After attending the New Brunswick schools, he studied at Betts Academy, Stamford, Conn., and later at Bowdoin College where he was graduated in 1913, and at Catholic University. He became an instructor in mathematics and chemistry at the Army and Navy School, Washington, D. C., and in 1917 he entered the Army, seeing overseas service as Captain of Field Artillery with the A. E. F.

In 1919 he joined the Worthington Pump and Machinery Corp., and in 1923 became assistant manager of oil and gas engine sales, with headquarters at Buffalo, N. Y., the position he had held until his death. In July, 1931, his headquarters were moved to the Harrison, N. J., plant.

He is survived by his wife Mary F. Clancy. Interment was at Arlington Cemetery.

American Natural Gas Co. Asking Franchises in Nebraska

American Natural Gas Co., said to be a subsidiary of the American Gas Construction Co., Minneapolis, Minn., is reported to be asking for gas franchises in Alliance, Crawford, Chadron, and Hemingford, Neb.

MEASUREMENT and CONTROL

TABLE No. 1.—PHYSICAL CONSTANTS OF PARAFFINE SERIES

Compound	Symbol Formula	Molecular Weight	Normal Boiling Point 760 mm. °F.	°C.	Liquid Density 60°F. —760 mm. grams per ml.	Specific Gravity "Perfect Gas" Specific Gravity Air=1.0
Methane	CH_4	16.03	—259	—161	0.2	0.553
Ethane	C_2H_6	30.05	—127	—88.3	0.4	1.037
Propane	C_3H_8	44.06	—44.0	—42.2	0.509	1.521
Iso-butane	C_4H_{10}	58.08	+10.0	—12.2	0.564	2.005
N-Butane	C_4H_{10}	58.08	+31.5	— 0.3	0.584	2.005
Iso-pentane	C_5H_{12}	72.09	+82.4	+28.0	0.624	2.488
N-pentane	C_5H_{12}	72.09	+97.2	+36.2	0.631	2.488

Gas Analysis

By EDGAR E. SHAFER, JR.

*Gas Research and Engineering Service**

IT IS the purpose of this paper to present a non-technical discussion of the analysis of natural gas as it is being conducted at the present time by companies treating large volume in the production of natural gasoline. The method used is known as "fractional analysis" to the natural gasoline industry. Although it has reached its present stage of development within the last few years, it has become practically indispensable to the engineer and refiner endeavoring to increase efficiency, and quality of products. No present day plant is built without first hand information of raw and finished products.

The California Natural Gasoline Association has only recently published Tentative Standard Procedures for Analysis by Fractional Distillation of Natural Gas and Gasoline, which were evolved after a period of several years. This may seem quite a while, when one considers the resources and talent made available by the major oil companies. Strange also, that the actual procedures were worked up to practically the present form and tried out in most of the laboratories before it was discovered that the ever present "personal element" necessitated a re-design of the apparatus.

An explanation of the procedure could not be presented within the scope of this paper because of the technique involved in actual operation of the apparatus in obtaining true distillation curves. Although every attempt has been made to eliminate the individual mannerisms it is doubtful that the personal touch will ever be lacking in an analytical distillation. During the fractional analysis of a dry gas similar to that which is distributed by the public utilities, fully two-thirds of the time is spent with the apparatus at a temperature of —259°F. A watchful eye and constant applications of liquid air are prime necessities, for liquid methane, if permitted to get too hot, will find a way out of the apparatus in much the same way as water does when put into a tightly corked bottle and thrown into a bonfire by small boys in quest of scientific amusement.

Before we get too deeply into the subject, bear in mind that we are dealing with a mixture of organic compounds, the composition of which is more or less unknown, although actual repetition of analyses of samples selected from any given field yields more or less the same composition. This unknown mixture is resolved into its individual components, accurately measured, and the subsequent analysis calculated to actual per cent by volume within a period of six to eight hours. When one considers what a complete quantitative analysis of any sample of ore, clay, brine, or even substances from fairly pure deposits would require in the way of apparatus, or time, one can appreciate the tremendous progress this form of analysis means to quantitative organic chemistry.

It must also be remembered that separation of the individual components is carried on by physical means, and that in no way is the gas altered in chemical composition. Why then, is it necessary to perfect a fairly expensive piece of equipment which is quite destructible, requires the use of special refrigerants, and involves a highly developed technique on the part of the operator? Let us review the forms of quantitative analysis employed by inorganic systems and organic systems of analysis.

Generally speaking, inorganic quantitative chemistry makes use of first titration, in which the quantity of unknown is determined from the amount of reacting substance, an excess of which is immediately shown by an indicator which changes in color; second, by precipitation, which involves a careful selection of temperature conditions and reacting substances to produce a very insoluble substance of utmost purity which may be weighed with precision; third, by special forms, such as matching solutions of colored salts against similar solutions of known compositions, or by microscopy, spectroscopy, and other forms of quantitatively determining substances peculiar to the various. In most cases chemical changes occur.

It is the dream of every organic chemist to be able to follow along similar lines in analysis of organic mixtures. Unfortunately, the problem is not a matter of how many elements are present and in what quantities, but a problem of the manner in which the few elements are assembled, and the proportion each resulting substance is of the whole.

Organic chemistry deals with the intricate ways the elements, carbon, hydrogen, oxygen, and in lesser amounts, nitrogen and sulphur, group themselves to form countless compounds. Starting with the simplest of the carbon-hydrogen combinations, methane, general classes of compounds are formed which have peculiarities which enable them to be distinguished from each other. These class characteristics are: reactivity with strong acids and alkalies, solubility in water, ease of decomposition by heat, and formation of stable compounds upon addition of bromine, or metals such as lead. The characteristic odors are often the most valuable clues to what the nature of the compound is. Having determined the class of compound, the next step is to isolate, if possible, the pure component, in order that it may be recognized by means of its melting point, boiling point, degree of solubility in pure solvents, such as water, alcohol, ether, carbon tetrachloride or benzene. It can readily be seen that quantitative analysis of an unknown mixture of organic compounds presents a research problem, especially if little is known of the substance one is trying to isolate.

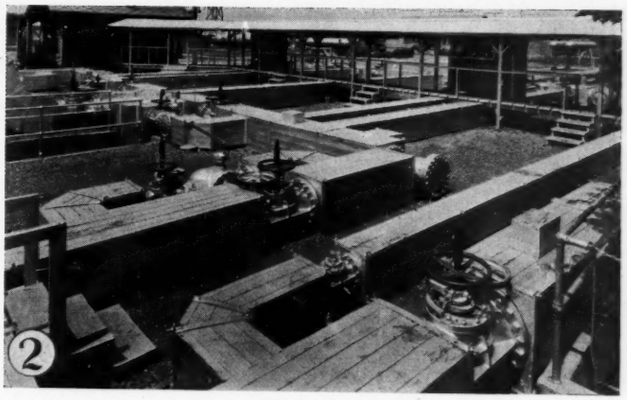
This brings us to a discussion of what is known as the paraffine series of hydrocarbons. Several important facts characterize this group. They are practically inert to strong acids and alkalies, having little or no solubility in water, react only with difficulty with bromine and other highly reactive gaseous elements. It can be seen however, from these characteristics that separation of a mixture of these hydrocarbons from each other by chemical means is impossible for analytical purposes. This leaves us only the consideration of their physical properties.

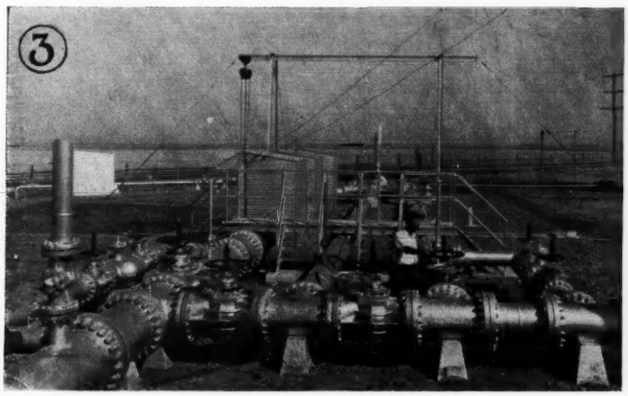
An examination of their melting points and boiling points shows very clearly the possibility of fractional distillation methods. The difficulties which have prevented the general use of fractionating columns for separation of low boiling hydrocarbons lie in their operation below room temperature and in the collection of the products. Natural gases found in the California fields are mixtures of paraffine hydrocarbons, of which methane and ethane constitute about 90 per cent of the whole. Referring to the table of physical constants (Table No. 1) it can be seen that the wide differences in temperatures at which these substances boil should make toward quantitative separation by efficient means of distillation.

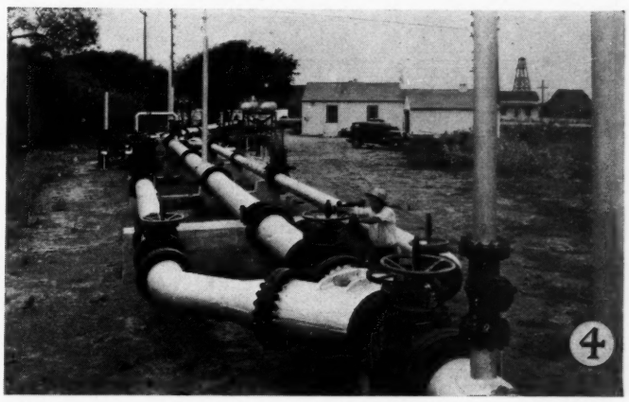
Considerable work has been done by various investigators, among whom W. J. Podbielniak is best known to the natural gas industry. The present accepted form of apparatus makes use of his original ideas and those investigated and worked out by the Research Department of the Standard Gasoline Co. The apparatus may most easily be thought of as consisting of two parts: the fractionating tube, and the receiving system.

(Continued on Page 39)

*Presented before the Southern California Meter Association, February 25, 1932.







Metering Installations in Northern California

ONE of the most interesting features presented before the Southern California Meter Association in recent months was the illustrated talk given by F. F. Doyle, at the December 17 session. Mr. Doyle, who is manager of the Pacific Gas and Electric Co's natural gas division, gave a review of measurement practice on his company's extensive system, and illustrated his remarks with numerous slides showing installations on the P. G. and E. and Stanpac transmission lines. From the selection of views shown before the S.C. M.A. Mr. Doyle has chosen those reproduced in these pages, and he supplies the accompanying descriptions.

F. F. Doyle

(1) Milpitas Terminal, Pacific Gas and Electric Co., showing general arrangement of orifice meters, regulators, operator's office, and runway from the office to the meters. Photo also shows flood lights, resident operator's cottage, and garage.

(2) Milpitas Terminal, Pacific Gas and Electric Co., showing method of boxing in piping and meter tubes to deaden noise caused by large volumes of flowing gas. This boxing is made of tongue and groove flooring and is filled with a rock wool, and has proved to be very effective.

(3) Tracy Terminal, Standard Pacific Gas Line Inc., showing regulators and orifice meter tubes. Regulators are placed in by-passes rather than in the line with by-pass around them, allowing full open flow of gas at periods of maximum load. Meter tubes are 20 inches and 16 inches in diameter.

(4) San Pablo Terminal, Standard Pacific Gas Line Inc., showing orifice meters and odorizing apparatus.

(5) Regulator and positive meter set-up feeding gas from the high pressure transmission line to a branch line, being located near Kettleman Hills. A small filter will be noted ahead of the set-up, also regulators before and after the meter, reducing the pressure in two stages from the main line to the branch line. The housing, which looks like a mail box, covers the positive meter, protecting it from the direct rays of the sun, and giving a very constant temperature of the gas flowing through the meter. By placing the meter between the regulators a constant pressure is kept on the meter also.

(6) Ordinary orifice meter set-up for an industrial consumer with pilot controlled regulator on downstream end of meter. Gauges mounted on tube are 10 inches and 50 inches differential recorders and a recording thermometer. Straightening vanes are installed in the tube at the flange shown on the upstream end of it.

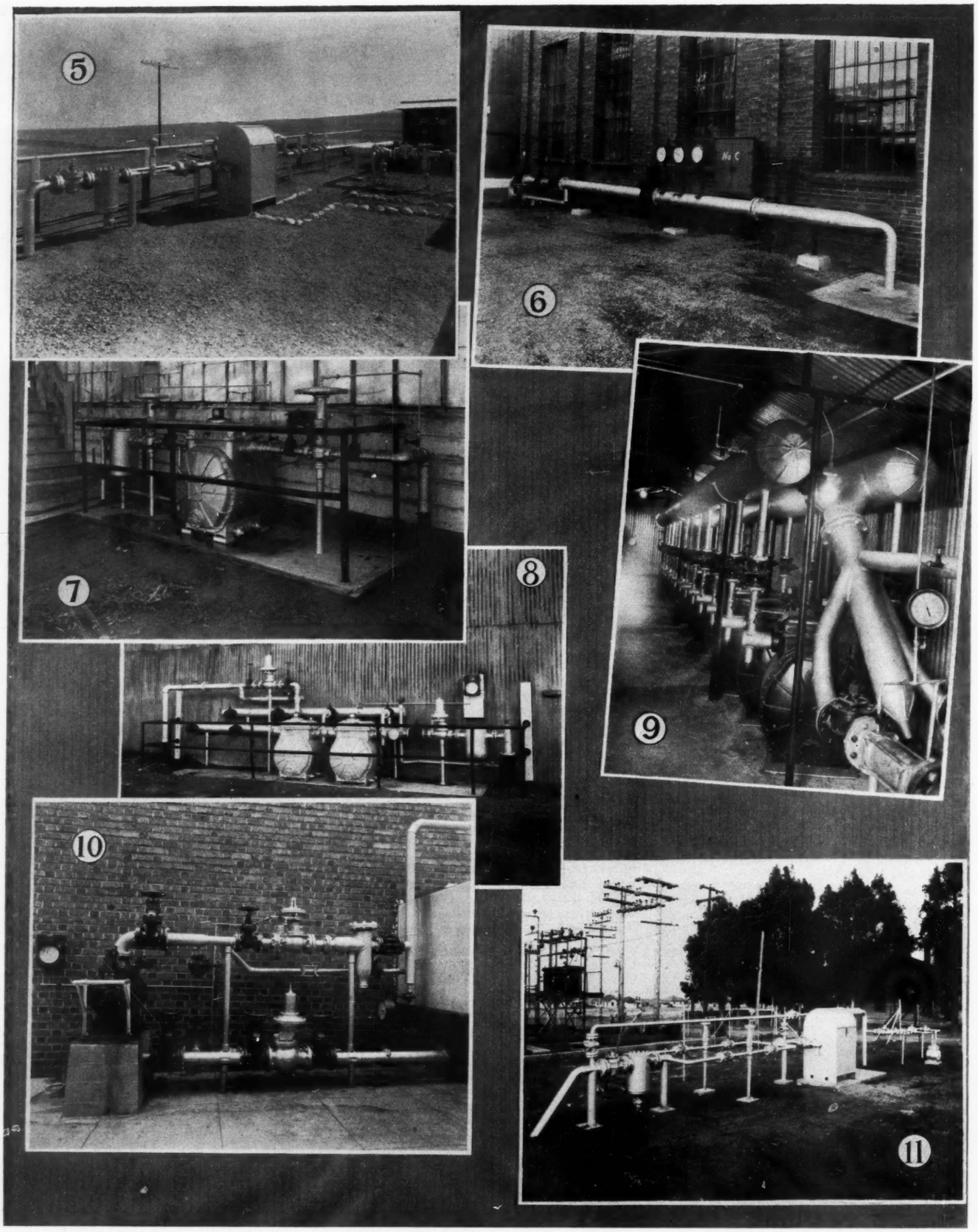
(7) Single positive meter set-up for an industrial consumer. Note dust trap ahead of set-up, regulator ahead of meter reducing line pressure and regulator at outlet of meter controlling desired pressure for customer. To figure volume, index of meter is read and multiplier determined from recording pressure gauge. The latter has two pens, recording also pressure to consumer.

(8) Double positive meter set-up, very similar to single set-up, , with provision for a third meter when the demand warrants it. Pressure on meters only is recorded in this case.

(9) Bank of 13 positive meters measuring gas to a large industrial consumer on the Pacific Gas and Electric Co.'s system, with a load that has a great variation. Load varies from 30 to 200 M.c.f. per hour, coming on and going off the line suddenly. Gas is supplied to a boiler plant generating steam for turbine driven generators supplying electricity for a railway system. At certain periods of the day several trains leave the main depot of the company in a short space of time, causing a large load on the plant and at other periods the trains are idle, except a few.

(10) Rotary type meter and regulators for an industrial meter set-up on the Pacific Gas and Electric Co.'s system. Average load on this meter 36 M.c.f. per hour, minimum 24, and maximum 50 M.c.f. per hour.

(Turn to Page 39)



Metering Installations on the Pacific Gas and Electric Co. and Standard Pacific Gas Line, Inc., Systems in Northern California

(11) Regulator and positive meter set-up serving an industrial consumer direct from the main line. Note two regulators in parallel ahead of meter, one being set at a slightly higher pressure than the other so that if something should happen to put it out of service and keep it from opening, the other regulator would automatically go into service. The small meter at the right hand side of the picture is for a domestic service.

swab on a wire or stick, together with some cleansing compound. If a wire is used, a slight scratch in the tube will cause breaking. Cleaning is not recommended for tubes used in high pressure service.

A. 124. A reading on a pulsating pressure gauge is governed by the period and magnitude of the pulsation. The most nearly correct pressure is obtained when there is a slight movement of the pointer. This will indicate the average pressure and indicates that the Bourdon tube is following the line pressure. A needle valve or some type of dampener should be used. Do not mistake a mechanical vibration of the pointer for a slight movement of the pointer due to pressure pulsation.

S. C. M. A.
Forum of Experience

"Knowledge is built upon the experience of others."

ANOTHER group of practical questions and answers on measurement topics appears in this month's "Forum." This department is conducted for readers of *Western Gas* by a committee of the Southern California Meter Association, with Edgar Valby as chairman. Any reader may submit his questions, or replies to questions published, addressing communications to S.C.M.A. "Q. and A." Committee, Box 1100, Station C, Los Angeles, Calif.

This Month's Questions

Q. 125. How accurate are specific gravity recorders, as compared to a gas gravity balance?

Q. 126. How may plugged gauge lines be prevented in steam meter set-ups? (Editor's note: Knowledge of a "best way" to meet this problem would eliminate many shutdowns of needed equipment.)

Q. 127. Is the use of pressure taps other than 2½ and 8 diameters, and flange taps, very common?

Q. 128. Is it possible to control gas pressure on a fluctuating load line, without causing the orifice meter to record beyond computation? (Editors note: The writer of this question desires to learn whether it is possible to control both pressure and flow, or whether it is necessary to sacrifice the one in order to control the other.)

Previous Questions Answered

A. 121. The gas gravity balance is only reliable to a degree governed by the completeness of its purging. As it is practically impossible to remove the gas film that clings to the inner surface of the balance, slight errors may result.

A. 122. The 50-inch meter is recommended over the 100-inch meter, due to resultant smaller pressure drop caused by the orifice, and also due to a greater accuracy in many cases where the static pressure is low. Most of the established Cv factors were obtained at differentials in the range of a 50-inch meter. The 50-inch meter is recommended over the 20-inch meter because of probable friction and mechanical troubles in measuring small differentials with the 20-inch.

A. 123. A glass tube which is dirty from mercury, is usually due to a chemical action of the mercury and soda glass. The tube is usually beyond cleaning and should be replaced. A dirty water column can be conveniently cleaned by use of a small

Hi-Jinks and Golf Play—March 19

ON March 19 the Southern California Meter Association met in its fifth annual Hi-Jinks, this year's celebration being held at the club rooms of the Central Manufacturers Club, in the administration building of the Central Manufacturing District, Los Angeles. Ed Lorenz, chairman of the Association's entertainment committee, and several associate members handled arrangements for the Hi-Jinks to everyone's complete satisfaction.

Dinner was served to some 200 members and friends of the Association at 7:30, and the evening wound up with an excellent program by musical and dance talent.

Preceding this year's Hi-Jinks came the annual Jubilee Tournament for S.C.M.A. golfers. This took place at the Rio Hondo Country Club, and featured the play-off for the S.C.M.A.—*Western Gas* Goodfellowship Trophy. Twelve winners of monthly tournaments held during the past year contested for the cup, and numerous other prizes were at stake. The tournament was in charge of A. E. DeBurn, who was assisted by Ralph Cook, T. K. M. Smith, and G. H. Unkefer.

H. C. Dahl, Midwest Piping & Supply Co., was the successful contender for the Goodfellowship trophy, with a net of 72. H. G. Miller of the Industrial Fuel Supply Co. tied for the cup, being eliminated by matching cards with Mr. Dahl on the basis of established handicaps.

Other tournament winners were as follows:

Low Gross: C. J. Warren, Chanslor-Canfield Midway Oil Co. Prize, a golf vest.

Low Net: A. G. Lindell, Industrial Fuel Supply Co. Prize, a carry-all bag.

Flag Tournament: John B. Miller, Industrial Fuel Supply Co. Prize, a statuette cigarette box.

Blind Bogey: Prize split between Jay Jenkins, *Western Gas,* and W. A. Spencer, Southern Counties Gas Co.

Odd Holes, 1st nine: H. C. Dahl. Prize, one-half dozen balls.

Even Holes, 2nd nine: W. J. Schomberg, Pacific Pipe & Supply Co. Prize, one-half dozen balls.

Short Holes: F. S. Fluor, Sr., The Fluor Corp., Ltd. Prize, a jigger.

Blind Holes: Jay Jenkins, *Western Gas.* Prize, a shoe bag.

The tournament opened at 11 o'clock Saturday morning, with nine foursomes participating.

For next year's monthly play a new cup has already been selected, the first tournament being dated for May 2.

Gas Analysis

(Continued from Page 36)

The fractionating tube is made of glass and consists of a tube of fairly large diameter surrounding a tube of very small diameter which is packed with a double spiral of nichrome wire which fits the tube quite snugly. The space between the two tubes is highly evacuated and the walls of the outer tube are coated with a deposit of silver which presents a mirror surface to incoming heat rays. Reflux is formed and controlled by means of a highly evacuated glass condenser jar located at the top of the fractionating column. This contains a metal expansion chamber into which liquid air is introduced. Light gasoline is used as a medium of heat exchange since it does not freeze at very low temperatures. This is agitated by means of a stirrer to prevent any temperature lag. A manometer is directly connected to the fractionating tube in order to enable the operator to maintain a definite pressure.

The receiving system consists of bottles which are likewise connected to a manometer of the leveling type. The entire apparatus must be absolutely gas tight, hence glass is used for all vapor passages and glass stop-cocks act as valves. The receiving system is separated from the fractionating tube by means of a stop-cock which when opened more or less, controls the rate of distillation. In operation of the fractionating column, all the gas and air are completely pumped from the entire apparatus up to the sample container, and the receiving system shut off from the fractionating column. The sample of gas is introduced into a small kettle or bulb which is immersed in liquid air. This reduces the entire sample to liquid form. The condenser portion of the column is cooled to below the boiling temperature of the lightest gas. The liquid air is cautiously removed from the liquefied gas and the latter is allowed to weather.

The receiving system which has been completely evacuated to 1 mm absolute pressure is carefully opened to the fractionating tube by means of the above mentioned stop-cock. The column is allowed to build up to atmospheric. Hence, during the distillation the difference between column pressure and receiver pressure causes vapor to flow from column to receiver. As long as the temperature at the top of the column remains the same during the distillation the removal of pure hydrocarbon is accomplished. As vapors flow from column to receiver the pressure in the latter gradually increases and approaches that of the column. Often several evacuations of the receiving system are necessary during the course of a single analysis.

A record is kept of the temperatures and pressure changes throughout the distillation, and at certain stages the gas will not flow from column to receiver unless the temperature of the condenser is allowed to warm up. The difference in the amount of pressure

increase, between these warming up stages, determines the amount of the hydrocarbon whose boiling point has been noted during the period when the temperature has remained constant. The gas is completely boiled from the fractionating tube into the receiver and the final pressure increase, when everything has been removed, is taken as the total amount of the sample. Thus, to take a simple case, a sample yielding a total pressure increase of 1000 mm, having been found to have 800 mm at methane temperature, 100 mm at ethane temperature, etc., would calculate an analysis of: Methane, 80 per cent, Ethane, 10 per cent, etc.

This method of analysis finds wide application in determining the gasoline content of wet gases and also how much gasoline is being lost in the dry gas, the nature of these losses, the nature of the gasoline which can be produced, and the type of equipment best adapted to these processes.

Wet gas usually contains a total of 40 per cent or more of isobutane, n-butane, pentanes, hexanes, and slight traces of heavier fractions. This portion of the gas, with exception of the isobutane is usually thought of as recoverable gasoline. When the gas is put through an absorption plant these fractions are isolated as a group and remain liquid at ordinary temperatures. The isobutane having a boiling point close to n-butane is usually included and is usually the contributing factor in the loss of material when the gasoline is tested by Engler Distillation. For this reason, and also because most natural gasoline has been bought and sold by this method of testing, isobutane has been considered undesirable. The high antiknock properties of this hydrocarbon are causing a slight revision of this conception. Fractional analysis is by far the most accurate means of determining this constituent.

Refiners troubled with complaints against their motor fuels on account of vapor lock have sought to eliminate this trouble by decreasing the amount of natural gasoline blended to the straight run stock, and have suffered from loss of volatility and easy starting. The solution of this problem has been brought about by accurate analysis of the straight run stock, and the refiner in most cases has found stock of 50 to 54 gravity containing up to 3 per cent propane, ethane, and even methane. Elimination of these by running the condensers hotter, or by stabilizing the stock, has enabled him to use a much higher percentage of natural gasoline without vapor lock and with consequent improvement in engine performance. This idea has led many to predict stabilization of crude oil to eliminate storage and handling losses.

Other applications of this method of analysis might be mentioned, but they would be of more interest to those intimately connected with refinery problems. It is evident to all that fractional analysis represents the highest form of practical application of physical and organic chemistry research to the gas and gasoline industries at the present time.

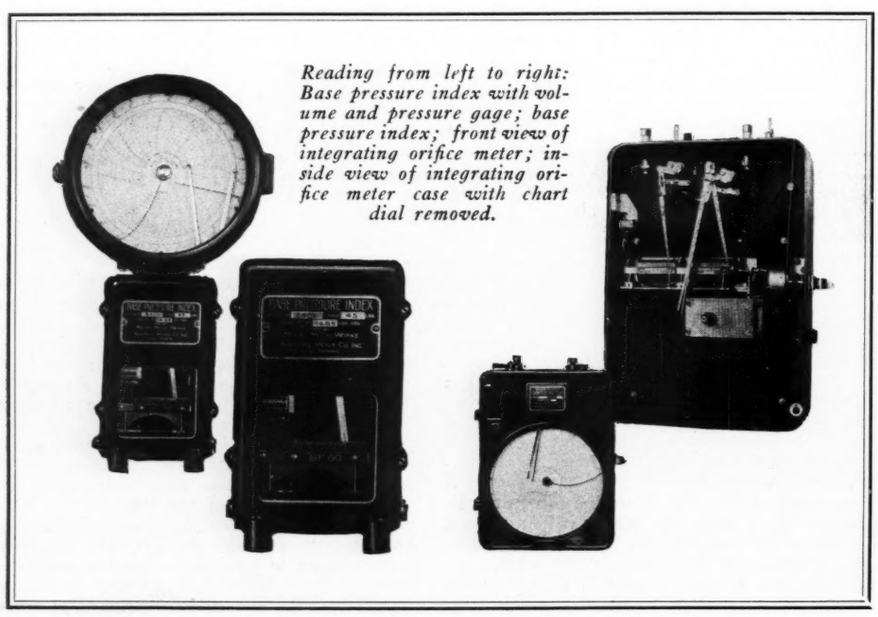
Measurement Devices by American Meter

THE March, 1932, issue of "Gas Measurement Engineering' published by the American Meter Co., New York, features two recent developments for gas measurement, the integrating orifice meter and flow meter, and the base pressure index.

The Westcott integrating orifice meter is the established Westcott orifice meter equipped with an integrator which gives a totalized indication of the quantity which has passed through the orifice for all rates of flow and all variations of pressure. In this integrator the effect of the pressure on the rate or the volume is continuously applied for any value or change in pressure from the perfect vacuum to the maximum pressure range of the instrument.

The integrator extracts the square root of the differential each minute and multiplies the square root of the differential by the square root of the absolute pressure. The sum of the products is continuously totalized on a counter index. The difference between the readings obtained at the end and the beginning of an interval multiplied by the meter constant gives the quantity which passed through the orifice during the interval. The operation of the integrator is continuous and power is supplied by a telechron clock. The primary multiplication is performed once a minute. The chart record shows the rate of flow and the pressure at any time and the instrument can be adjusted and recalibrated in the field. The Metric integrating flowmeter is the Westcott orifice meter without pressure spring, equipped with an integrator which gives a totalized indication of the quantity of gas or steam at constant pressure, or of liquids which pass through the meter regardless of the rate.

The base pressure index automatically multiplies the quantity of gas passing through the meter, at pipe line conditions, by the product of the line pressure divided by the base pressure and registers the resultant on a straight reading index. This device is fully described in Bulletin E-12 published by the American Meter Co.



Reading from left to right: Base pressure index with volume and pressure gage; base pressure index; front view of integrating orifice meter; inside view of integrating orifice meter case with chart dial removed.

Unkefer Now With American Recording Chart Company

G. H. Unkefer

G. H. UNKEFER who for seven and one-half years was manager of Westcott & Greis, Inc. at Los Angeles, has accepted a position with the American Recording Chart Co. as sales engineer for the Pacific Coast and Mid-Continent areas. The company is manufacturer of the Red Center line of orifice meter charts. Mr. Unkefer will make his headquarters at the Los Angeles office of the company, 428 Boyd St.

Mr. Unkefer has been engaged in measurement engineering since 1916, and is active in the affairs of the Pacific Coast Gas Association and the Southern California Meter Association.

Drilling Campaign for Gas Supply for Cut Bank-Spokane Carrier

Plans for an extensive drilling campaign in the Cut Bank field of Montana, are about complete by the Jerome Drumheller interests of Spokane, Wash. According to report, a gas supply will be developed for the Spokane area, and possibly for points on the West Coast. It is also reported that a cooperative movement is being planned by Montana operators headed by J. H. Hamilton, Great Falls, for developing a large gas supply for the projected carrier. Two routes for the line have been surveyed; one would take it through Missoula, Mont., and Coeur d'Alene, Idaho, and the other straight west from the Cut Bank field along the right-of-way of the Great Northern Railroad.

Purchase of Merco Nordstrom by Pittsburgh Equitable Meter Co.

Announcement is made of the purchase by Pittsburgh Equitable Meter Co. of the Merco Nordstrom Valve Co. of Oakland, Calif., manufacturer of valves and plug cocks for the gas industry. The company plans to maintain Pacific Coast branch headquarters in Oakland, according to W. F. Rockwell, president of Pittsburgh Equitable. The plant of the Merco Nordstrom Valve Co. occupies two acres, and is operated by about 200 employees.

Mid-West Gas Assn. Plans April Session

J. K. SWANSON, vice-president and general manager of the Minneapolis Gas Light Co. and president of the Mid-West Gas Association, will call the latter organization into its 27th annual convention deliberations on April 11. The three-day meeting will be at St. Paul, Minn., with headquarters at the Hotel St. Paul.

J. K. Swanson

Following welcome by Governor Olson of Minnesota, and an address on "Our Working Tools" by Alexander Forward, A. G. A. Managing Director, the convention will turn to business reports and elections.

On the tentative program, details of which are provided *Western Gas* by R. B. Searing, secretary-treasurer of the Association, appear several important dealer relations discussions. These will feature the opening day's program and include: "Experiences of the Minneapolis Master Plumbers' Association with the Gas Company", by A. E. Harroun, Minneapolis Master Plumbers' association; "The How's and Why's of Dealer Relations", Thomas E. Bullion, director of sales, Detroit-Michigan Stove Co.; "Relationship of Dealers and Gas Utilities from a National Standpoint", A. E. Higgins, secretary, Natural Gas Department, A. G. A.

Papers to be heard on April 12 are the following:

"Gas Measurement and Pressure Regulation at High Pressures", Allen D. MacLean, Chief Engineer, Pittsburgh Equitable Meter Co.

"Air Conditioning and Residential Cooling", (author not yet selected).

"Greater Residential Gas Sales", C. A. Nash, vice-president in charge sales promotion, United Light & Power Engineering and Construction Co.

"Merchandising Gas Appliances", E. J. Boyer, Sales Manager, Minneapolis Gas Light Co.

"Sales Promotion Through Advertising", (author not yet selected).

"Cleanliness" (Gas Heated Hot Water), (author not yet selected).

"Prepare for Natural Gas" is a theme to be treated at the closing session of April 13, the speaker to be named later. Robert L. Klar of the Des Moines Gas Co. will discuss the "Eleventh Meter School and Conference", conducted at Ames, Iowa, last December.

John K. Swanson, this year's president, will dismiss the convention with an address entitled "Let's Check up on Ourselves".

During the sessions the Mid-West group's A. G. A. representatives will submit reports, as follows:

Manufacturers' Representative—Roger W. Polk, United Engineers & Constructors.

Technical Representative—R. L. Schacht, Iowa-Nebraska Light & Power Co.

Commercial Representative—M. L. Nolen, Cedar Rapids Gas Co.

Advertising Representative — Walter V. Turner, Robbins Publishing Co.

Industrial Representative—Thos. L. Connor, Peoples Gas & Electric Co.

R. J. Daugherty
President

E. F. McKay
Manager

J. Y. Wheeler
Public Relations

C. D. Greason
Gas Division

Daugherty Elected to Head Oklahoma Utilities Association in 1932

GAS men played a prominent part in the Fourteenth Annual Convention of the Oklahoma Utilities Association, which was held at the New Hotel Tulsa, Tulsa, Okla., March 8 and 9. More than 700 executives and employees of public utility companies, operating in Oklahoma and other states, were registered. These included representatives of gas, electric, electric railway, and telephone utilities and manufacturers and suppliers of gas and electric appliances and equipment.

The following new officers were elected for the ensuing year:

President—R. J. Daugherty, Bartlesville, director of information service department, The Empire Companies.

First Vice-President—R. J. Benzel, Oklahoma City, general manager, Southwestern Bell Telephone Co., (re-elected).

Second Vice-President—H. B. Cobban, Miami, general manager, Northeast Oklahoma Railroad Co.

Treasurer—W. R. Emerson, Oklahoma City, vice-president, Oklahoma Gas & Electric Co. (re-elected).

Manager—E. F. McKay, Oklahoma City, (re-elected).

Each Division elected a division chairman and one or more members of the executive board of the Association to fill expired terms or vacancies. New officers of the Gas Division are: Chairman, C. D. Greason, Gas Service Co., Kansas City, Mo., succeeding J. W. Duvall, formerly with the Consolidated Gas Service Co. at Oklahoma City.

Representatives elected to the executive board are: C. A. Breitung, manager, Southwest Gas Utilities Corp., Ada, Okla., to fill the expired term of E. C. Deal, Oklahoma Natural Gas Corp., and C. D. Greason, to succeed Logan W. Cary, Oklahoma City, president, Consolidated Gas Service Co., who resigned from the board.

R. J. Daugherty, the new president of the Association, is prominent in the gas industry, and is also mayor of the City of Bartlesville, Okla. Mr. Daugherty was also elected a member of the executive board of the Association representing the Public Relations Division.

Among other men who are connected with gas or gas and electric companies who were elected to official positions of the Association were J. Y. Wheeler, Wynnewood, Okla., superintendent in charge of Oklahoma operations of the Community Natural Gas Co., chairman of the Public Relations Division; S. E. Wolff, president, Oklahoma Power & Water Co., Sand Springs, executive board member from the Electric Division, and S. I. McElhoes, vice-president, Southwestern Light & Power Co., Oklahoma City, chairman of the Electric Division.

All of the divisions of the Association, excepting the Telephone Division, met in joint sessions on both days of the convention. Addresses covered many subjects of general interest to the utility industry, including a number dealing with gas. Among addresses and papers of special interest to the gas industry were the following: "Where the Customer Takes Our Measure", by Kurwin R. Boyes, New York City, secretary, American Gas Association. Discussion by W. H. Bagley, Oklahoma Natural Gas Corp., Tulsa, "Two Trillion Cubic Feet", by T. J. Strickler, vice-president and general manager, Kansas City Gas Co., Kansas City, Mo., and chairman of the Natural Gas Department, A.G.A. "Cost of Government", by H. H. Smith, Tulsa, secretary, Mid-Continent Oil & Gas Association. "Appliance Merchandising in Oklahoma—1932", by William Parkerson, general commercial manager, Public Service Company of Okla., Tulsa. Discussion by W. J. Young, Oklahoma Natural Gas Corp., Tulsa, and C. A. Breitung, Southwest Gas Utilities Corp., Ada.

A first aid session was held at the New Hotel Tulsa on the night of March 7 as a prologue to the regular convention. Four men's teams participated in the first aid contest staged under the direction of L. M. Jones, Oklahoma City, chairman of the Safety Section of the Association. The team of the Oklahoma Natural Gas Corp. won first place in this contest and was again awarded a handsome loving cup, which it won for the first time at the 1930 convention. The team which wins it three times in succession will be awarded the cup permanently. All of the members of this team are employees of the Oklahoma Natural Gas Corp., at Morris, Okla., and are: Floyd Callison, Bruce R. Agan, John A. Lauderdale, S. P. Bearden, Fred Wood, Otto Rose. Glen Rambo is sponsor. The team of the Southwestern Bell Telephone Co. was awarded second place. Each member of the first and second teams received a first aid kit. The women's team of the Oklahoma Natural Gas Corp., composed of Ruby Barth, Alice Knaell, Viva Haslen, Mary Gillespie, Ruth Arrington, Mildred Hardy and Maxine Strong, put on a demonstration of first aid methods.

The annual dinner of the convention was held on the night of March 8 in the Topaz Room of the New Hotel Tulsa with J. F. Owens, Oklahoma City, president, National Electric Light Association, as the principal speaker. S. I. McElhoes, Oklahoma City, vice-president of the Southwestern Light & Power Co., and retired president of the Association, presided at the dinner.

TWELVE Homes and their Gas Heating bills for 12 months—selected at random from our files:

ADDRESS	ROOMS	TOTAL BILL 1930-31
1506 Alberni	6	$105.64
*955 Broughton	8	133.15
2246 Franklin	6	79.46
4444 West 5th Ave.	10	175.98
2958 West 45th Ave.	6	140.47
1186 Harwood	5	94.40
*6626 Laburnum	8	183.37
1745 McSpadden	6	88.33
960 West 19th Ave.	5	86.90
1225 Pacific	5	75.49
*3156 East 22nd Ave.	7	154.17
3058 West 12th Ave.	5	69.66

*Denotes that bill includes cost of gas used for 12 months' water heating—with an automatic gas water heater!

B.C. Electric
GAS DEPARTMENT

Two pages from a B. C. Electric pamphlet on house heating.

House Heating Sales at Vancouver, B. C.

By J. FREMONT
Sales Manager, British Columbia Electric Power & Gas Company, Ltd.
*Vancouver, B. C.**

OUR initial efforts at selling manufactured gas for heating were begun about eight years ago, when we introduced a special rate of 75c per 1000 cubic feet on the first 10,000, with all in excess, 60c per 1000. This rate applied to central heating plants. We have a straight 75c rate for one or more gas fires or other space heaters.

At the beginning all the salesmen turned in prospects, with one heating engineer estimating and supervising installations, but after a year or two we inaugurated a heating department with qualified engineers in charge, and heating sales were taken out of the hands of our ordinary district salesmen.

The first year we installed 23 furnaces and two vacuum systems, and incidentally the customer who purchased our first furnace is today one of our most enthusiastic and biggest boosters.

Originally our chief competitor was coal, selling around $12 a ton, having a heat value of approximately 12,000 B.t.u.'s per pound. Oil was then quite in the background.

We offered three types of central heating —the warm air furnace, the vacuum system and hot water boilers. The warm air furnace has proved the most popular type for house heating, the capital investment for equipment being reasonable and the cost of operation still more so. Our average cost furnace heating is $15 per room per season. This average was arrived at by selecting at random a great number of different jobs over a period of years, and it has proved a safe figure to work on.

The introduction of air conditioning in conjunction with warm air heating has opened up a vast field of possibilities, and we have already met with considerable success in this direction. I am of the opinion that this is one of the biggest opportunities in the gas heating business today.

In converting a number of our gravity jobs to the air-conditioning system, we have been agreeably surprised at the reduced cost of operation—this in some instances running as high as 50 per cent.

The vacuum system has proved our most successful heating plant for commercial buildings. The fact that we have put in 187 systems at a sales value of well over a quarter of a million dollars speaks for itself. For efficiency, flexibility and low cost of operation it is hard to beat.

With the vacuum system overcome many venting problems can be overcome, and it is possible to get into buildings that would otherwise have to be turned down. Last year we completed our largest job—the offices of the new Canadian National Steamship Dock. The amount of radiation installed was 6745 square feet, comprising 74 radiators. The total cost was $13,000. The expected annual consumption will be about 2½ million cubic feet.

We have at least 25 churches heated with this system, and all satisfied customers—a complaint of a high bill being a rarity.

With hot water installations we have made little or no progress, the cost of operation in our territory being so much out of line with other kinds of heating. Our jobs run anywhere from 33c to 50c per foot of radiation per season. Then, too, the first cost of boiler equipment is quite a handicap owing to the fact that we have to import boilers, on which there is a heavy duty.

Since the inception of our heating rate we have sold and connected 517 furnaces, 187 rector systems, 34 hot water boilers and 7100 fires—the total cash value of sales being $650,000. We have nearly 500 miles of mains and 45,000 consumers. The B.t.u. content of our gas is 467.

Last year we sold nearly 250 million cubic feet of gas for heating purposes, representing approximately 20 per cent of our entire output.

Coal sells for around $10 per ton and oil from 4½c to 9c per gallon.

We reduced our heating rate last year by putting in a third step—all consumption over 20,000 cubic feet 50c per 1000, and have hopes of a further reduction in the near future.

Now, as to how we have built up our heating business: I think the following few golden rules are responsible for what we have accomplished:

1. Using the greatest care in thoroughly analyzing a job before recommending any type of heating plant.

2. Selling only those that we knew we could hold, and turning down anything doubtful.

3. Avoiding, wherever possible, predicting a customer's heating bill, and last, but not least, selling gas—the modern fuel, on its merits as the best and only truly automatic heating.

And there is just one other rule—Lots and lots of hard work.

* Presented at the Pacific Coast Gas Association's Northwest Sales Conference, Tacoma, Wash., January 22, 1932.

G. Blanchard Smith to Represent Reynolds in Mid-West

G. B. Smith

REYNOLDS Gas Regulator Co. of Anderson, Ind., announces the appointment of G. Blanchard Smith as sales representative in the Kansas City area. His territory embraces the states of Kansas, Nebraska, Missouri, Colorado and Iowa.

Mr. Smith was for several years connected with the sales force of Westcott & Greis, Inc., Tulsa, Okla., giving him a practical background for the solution of regulator problems.

Central Illinois Public Service Gets New Permits

PERMISSION has been granted by the State Commerce Commission of Illinois, to the Central Illinois Public Service Co. to distribute natural gas in Pittsfield, Carrollton, Jerseyville, Villa Grove, Tuscola and Virginia, and the Panhandle Illinois Pipe Line Co. has been authorized to construct transmission lines to these cities and towns. A 30-mile line would probably extend to Jerseyville, and serve Roodhouse, Whitehall, and Carrollton en route. Pittsfield will be served

from a short lateral, as will Villa Grove. Tuscola is close to the main 24-inch line.

It is reported also that C.I.P.S. Co. has been granted permission to change to natural gas service in Hoopeston, and that Panhandle Illinois Pipe Line Co., may construct an extension from Danville to serve the town. Virginia and Beardstown, also served by Central Illinois Public Service Co. will be changed over to natural.

Elder and Phillips in Gas Sales Posts for San Diego Consolidated

SUBSEQUENT to the announcement that natural gas would be available to San Diego customers about September 1, A. E. Holloway, vice-president in charge of sales for the San Diego Consolidated Gas and Electric Co., has appointed H. W. Elder, gas sales engineer in charge of large commercial and industrial installations, while Ralph Phillips has been promoted to the position of engineer in charge of general gas sales promotion.

H. W. Elder

Both men are trained in solving problems of a gas engineering nature and have recently made exhaustive studies of natural gas application in the San Francisco Bay and Los Angeles areas, to the end that the local change-over from the present manufactured product will be conducted efficiently and with the least possible inconvenience to customers.

Anticipating an immediate demand for general information on the utilization of the natural product, Mr. Holloway has placed the dissemination of this information under the supervision of Mr. Elder and Mr. Phillips.

Prairie Merger Affects Several Gas Companies in the Southwest

Gas properties affected by the merging of the Prairie Oil & Gas Co. and the Sinclair Oil Co., to operate as the Consolidated Oil Corp., as ratified by stockholders of the companies the last of February, are the Producers and Refiners Co. and the Southwestern Development Co.

The latter interest owns all the capital stock of the Canadian River Gas Co., Amarillo Oil Co., Amarillo Gas Co., Panhandle Pipeline Co., Red River Gas Co., South Plains Pipeline Co., West Texas Gas Co., Dalhart Gas Co. and Clayton Gas Co. It also owns jointly with the Standard Oil of New Jersey, the Colorado Interstate Gas Co., which company constructed, and now operates the 350-mile line from Amarillo, Texas, to Denver, Colo.

Producers and Refiners Corp. owns jointly with the Midwest Refining Co. a 90-mile gas pipe line, supplying gas to the Midwest and Standard of Indiana Refinery at Casper, Wyo.

Harry F. Sinclair is chairman of the executive committee of the new corporation; H. R. Gallagher will be president, and W. S. Fitzpatrick, chairman of the Board of the Prairie Oil & Gas Co., will likely direct the activities of the corporation.

Citizens Gas Co. Applies at Seminole

Seminole, Okla., will vote shortly on the franchise application of the Citizens Gas Co. to serve gas in the town.

Service After Sales Holds the Load

(Continued from Page 27)

sufficient to carry the heating load before we accept the heating responsibility.

The third and most important step in our selling plan is the back-bone of holding our house heating load. We employ a careful, personal systematic follow-up of our heating sales, by our new business department every month.

In our territory, this is done by personal letter, not a form letter, to each house heating customer, reaching him at the close of each month, after his meter has been read—but before he receives his monthly bill, and dealing with what his gas bill should have been and what it actually is. It is not necessary to tell your customer about Degree Days because he does not know what they are. You can obtain from the nearest U. S. Weather Bureau station, the average temperatures during this same month, and from your American Gas Association house heating manual determine if this same month has been an average month; above or below the average. No matter what the case may be, when you tell your customer what the U. S. Weather Bureau has to say about the weather, we have found this sufficient proof to convince him of the fairness of his gas bill.

The last, and an important, point that we use in attempting to hold our business is to have the customer sign a proposal and acceptance of a house heating contract, in addition to the regular sales contract. This agreement is presented to our customer to make him feel that he really has had an intelligent investigation of his heating requirements, which binds our company as far as the heating of the home is concerned, but does not bind our company regarding the cost of heating the customer's home.

During the summer months we clean our installed burners and gas fired boilers and furnaces. We also check the flue to see that it is open and clean. The safety pilots are checked, and cleaned to see that they are in working order.

Having a record of the actual radiation required we also check the gas demand at the burner to see that it is proper to take care of the full load. We have also found that the checking of the flue for draft and good combustion cannot be done during the milder months. Thus with the first extreme weather, at the beginning of the heating season our service men check all heating plant installations for these conditions. And last, as a small touch of sales service, each year we patch up any asbestos covering that may have fallen off the heating plant; paint the iron work around the front of the heating plant with a good black paint, touching up the letters of the name of the furnace or boiler manufacturer with gold paint. This leaves visible evidence that the gas company is on the job, servicing their house heating business.

I believe that the holding of our domestic load today will vary directly with the amount of sales service we attempt after the sale has been made. We must sell gas service and not gas appliances.

First So. Calif. Cooperative Campaign

THE gas range trade in southern California is now holding its first cooperative range sale, with furniture and hardware dealers, department stores, gas utilities and manufacturers all participating.

This event will last for nine shopping days, beginning March 28 and ending April 6. During this time all dealers who are taking part are giving a 20 per cent trade-in allowance for the old range to purchasers of insulated, full enameled gas ranges of regulation size and with oven heat controls.

Practically all range manufacturers doing business in the area have agreed to assist their dealers who are participating by giving them an additional discount upon all qualifying ranges sold during the nine days and upon which the 20 per cent trade-in allowance was made.

The Joint Advertising Committee of the Los Angeles Gas and Electric Corp., the Southern California Gas Co. and the Southern Counties Gas Co. is assisting this sale with a strong advertising campaign in Los Angeles. This support consists of a series of large newspaper advertisements and over 150 full-sized poster boards, all of which feature the phrase "See your Gas Appliance Dealer." This committee has also prepared a number of dealer helps for free distribution, such as window stickers, counter cards and circulars.

In addition to the joint advertising effort, the Southern California Gas Co. and the Southern Counties Gas Co. are giving individual support to the sale by newspaper advertising in their respective territories outside of Los Angeles. Dealers and particularly downtown Los Angeles department stores, are also featuring the event very heavily in their advertising, while one manufacturer is announcing it over 12 radio stations.

The plans for the Cooperative Range Sale were developed by a committee consisting of H. E. Davidson of the Southern California Gas Company, chairman; E. P. O'Keefe, of O'Keefe and Merritt Co.; Joe Moore, of the A-B Stove Sales Co.; D. J. Williams, of the Retail Furniture Association; J. V. Guilfoyle, of the Southern California Retail Hardware Association; E. C. Mitchell, of the Retail Dry Goods Merchants Association; Clyde H. Potter, of the Southern Counties Gas Co., and J. S. Spaulding, of the Joint Advertising Committee.

Robert Otto Now Counsel for Laclede Gas Light Company

Robert W. Otto of Jefferson City, Mo., has been named counsel for the Laclede Gas Light Co., St. Louis, Mo. He was formerly Judge of the United States Supreme Court in the State of Missouri. According to Edward P. Gosling, president of the company, he assumes his new position immediately.

Craig, Colo. to Have Service

Work is expected to begin as soon as frost leaves the ground on a pipe line from the new wells of the Ohio Oil Co., three miles southwest of Craig, Colo., to the town. Ohio Oil Co., Casper, Wyo., has the natural gas franchise at Craig, and will also construct the distribution system there.

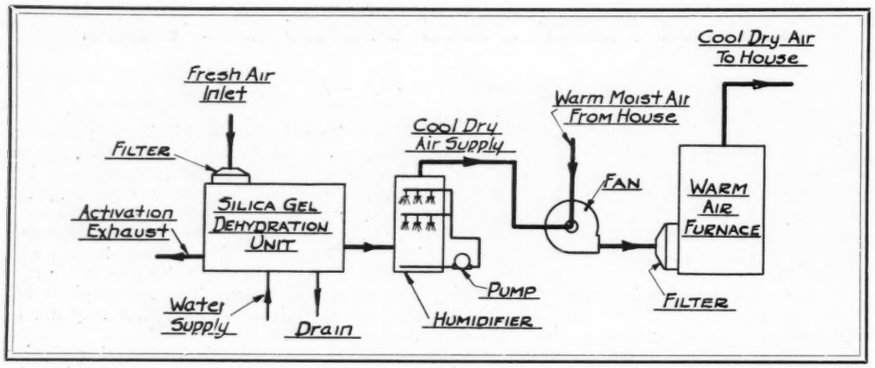


FIG. 3—Diagrammatic flow sheet of Silica Gel summer air conditioner as applied in localities having high tap water temperature.

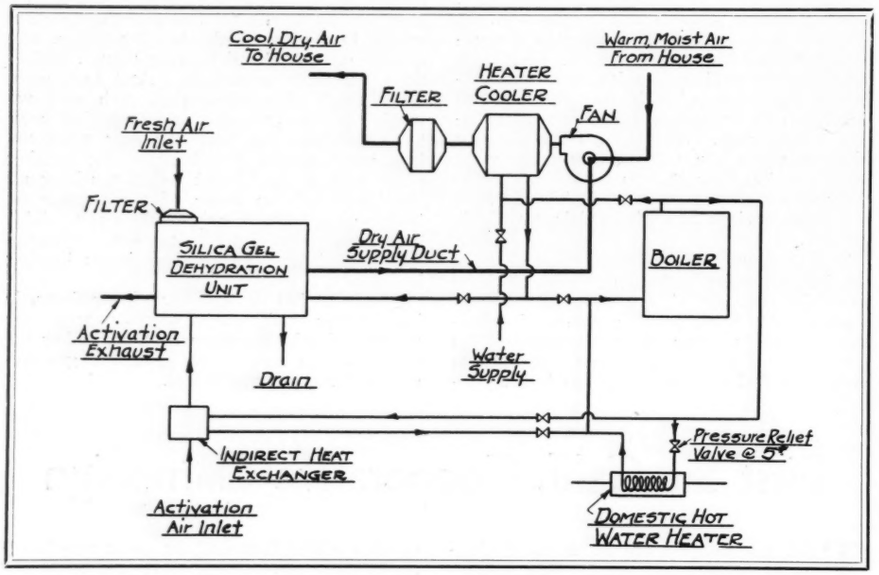


FIG. 4—Silica Gel summer air conditioner with boiler and heater-cooler for winter heating using high boiling compound and heat exchanger for activation.

The Flow Cycle for Air Conditioning

(Continued from Page 26)

In winter, the warm air furnace operates in the customary manner, heating and humidifying the air. At such times, of course, the cooler and dehydration unit are not in use. The main air-flow still passes through the cooler, but as no water is flowing, the temperature of the air is not changed in its passage through it.

Figs. 2, 3 and 4 are merely modifications of the above explained system.

Fig. 2: In Figure 2, the warm air furnace is eliminated. A boiler is used for winter heating. The cooler in the main air stream, which is the same as that shown in Fig. 1, is also used as a heater in winter. In summer, the system operates exactly as in Fig. 1, the boiler being inoperative. Under these conditions, the supply and return valves on the boiler are closed and the water valves to the cooler and dehydration unit are open. In winter, the dehydration unit is inoperative and the water valves are closed to the unit and the cooler. The supply and return valves on the boiler are opened and the boiler supplies hot water to the cooler which now acts as a heater. Thus the same surface is used for heating the house that is used for cooling it. A humidifier may be included in the heater casing.

Fig. 3: This figure shows the arrangement in localities where the tap water is of too high a temperature to maintain a satisfactory temperature in the house. In this case, an excess quantity of air is dried in the dehydration unit and this air is cooled (to the limit established by the water temperature) by an indirect cooler in the dehydration unit as before. Either tap water or water from a cooling tower may be used for this purpose. The dried air is then passed through a small humidifier which partially saturates it and causes a large drop in its temperature. Thus the principle of evaporative cooling is used. Because an excess quantity of air has been dried, this cooling effect can be secured with a sufficient quantity of dry remaining to still maintain a low relative humidity in the main air stream to the house.

Fig. 4: This is the same as Fig. 2, except that the same boiler is used for supplying activation heat to the dehydration unit in summer and for supplying heat to the house in winter. The boiler may also supply a domestic hot water heater as shown. In winter the operation is as described for Fig. 2. In summer, the valves between the boiler and the heater-cooler are closed and the cold water supply valves are opened to the cooler and the dehydration unit. At the same time the valves to the indirect heat exchanger are opened. Thus the boiler supplies heat to the activation air stream during the summer, to drive the moisture from the Silica Gel beds being re-activated. Of course, any fuel may be used to fire the boiler.

W. M. Hines is Named President of Southwestern Natural Gas Co.

SELECTION of W. M. Hines as president of the Southwestern Natural Gas Co. has been announced by the board of directors following a meeting held in Tulsa, Okla., recently. Home offices of the Southwestern are in Tulsa.

Mr. Hines has been an active public utility executive for the past five years, first being associated with Coast Counties Gas & Electric Co. of Santa Cruz, Calif., and later with Pacific Public Service which operates and controls gas properties in Washington, Oregon and California. Pacific Public Service is a subsidiary of Standard Oil of California. It was for this company that Mr. Hines obtained franchises throughout western states.

W. M. Hines

Although the Southwestern Natural is a gas transporting company, its dealings are with Oklahoma gas utilities, and a man with a public utility background was chosen by the directors for the position. Southwestern Natural is one of the largest companies of its kind in Oklahoma.

Coming to Oklahoma from California, the new president began extensive research work in the gas utility industry and after becoming prominently identified with progressive natural gas activities, he was selected by the board of directors of Southwestern Natural for the leading executive position.

Formula for Determining Thicknesses For C. I. Pipe, Feature of Booklet

An illustrated discussion of the Modified Fairchild Formula for determining metal thicknesses for cast iron pipe is a feature of a new booklet, "Specifications for Acipco Mono-Cast Centrifugal Cast Iron Pipe, Bell & Spigot, 1932," now being distributed by The American Cast Iron Pipe Co., Birmingham, Ala.

The new booklet is occasioned by the recently promulgated Federal specifications for bell-and-spigot cast iron pipe in which certain revisions of former requirements are contained. Complimentary copies of the booklet may be obtained by writing to The American Cast Iron Pipe Co., Birmingham, Ala., or to any of the company's branches.

Bardstown, Ky., Franchise Sold

It is reported that Kentucky Public Service Co., has purchased the natural gas franchise at Bardstown, Ky.

Cooperative Sales Campaigns

(Continued from Page 23)

While on the subject of heating I should like to mention that the company has prepared a standard code which is recommended for the installation of warm air heating equipment in northern California. It has been adopted by the Gas Appliance Society and the Furnace Dealers Association and has proven valuable in securing adequate and proper installations of heating equipment. This code is supplemented by a standard uniform gas heating estimate and proposal which is available to all dealers at minimum cost.

We also have a cooperative selling campaign of heating scheduled during the period of October 1 to December 31, which will be known as the Fall Campaign. This campaign will have no special inducements but will be a concentrated drive by the entire industry using newspaper advertising and supplementary sales promotional media.

Gas ranges will be campaigned intensively during the last part of April or the first part of May. Since it is the policy of the company to restrict its direct sales activity to pioneering and creative sales work it does not engage in the selling of gas ranges in the larger metropolitan areas; therefore, this campaign is an intensive dealer drive, conducted by the Gas Appliance Society. This is an organization composed of manufacturers, jobbers, retailers, and Northern California utilities.

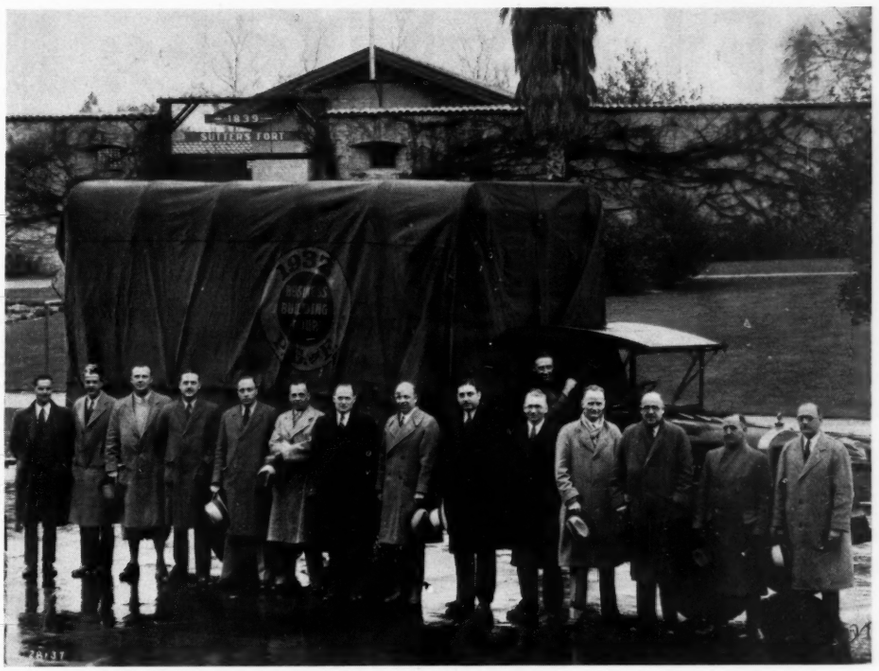
The campaign will likely be a short intensive drive in which an inducement is made to buy ranges priced at $116 or more by offering the oven heat regulator free for the period of the campaign; the price of the regulators being stood, half by the retailer, and half by the manufacturer of the range sold. This campaign is always supported by the newspapers; entire sections are devoted to advertising and publicity, all of which is paid for by the retailer. Cooking schools, and essay contests are usually held in conjunction with it and the results are most gratifying.

As previously stated we feel that we have made considerable headway with these cooperative selling campaigns. In my opinion our success has by no means been entirely due to the plan of the campaigns themselves, but more particularly to the work done in preparing for the campaigns and the careful attention to the details of getting dealers and manufacturers to tie in with them and feel that they are their campaigns.

Sometimes it is the smallest wrinkle in the scheme of things that makes or breaks a selling drive, and a provision which is apparently remote and ineffective proves to be the balance wheel which makes for stability and puts the campaign across in an harmonious and united constructive drive.

While we have done a lot of work with dealers and have secured a fair degree of cooperation from them, I do not wish to be misunderstood. We do not have the wholehearted support of 100 per cent of the dealers in the territory, and probably never will have. Of course, dealers generally are of the opinion that the utilities discontinuing the direct sale of appliances would be to their distinct advantage, and they will apparently persist in this opinion in the face of all proof to the contrary, and regardless of how favorable the utility merchandising program is to them. In fact, I believe that even if we were to discontinue all direct sales of appliances, we would still have dissatisfaction and a certain amount of complaints from dealers concerning the way we might conduct our business, regarding the handling of prospects, the giving of service, the fairness of rates, and what not.

The process can go on and on and no matter how much the utility gives the dealer, he will still want more. Each utility must appraise the dealers' present and potential value in the promotion of its business in the various territories wherein it operates, and develop a program that will encourage the dealers to more aggressively exploit the appliance market and consider it an important part of their business. This, however, must be accomplished without the means of subsidies and financial assistance which have the tendency to discriminate against the successful, aggressive, and capable dealers, in favor of the dormant, unprogressive and irresponsible ones, thus breaking down the institution of independent dealer enterprises.



P. G. and E. road show "on tour." Left to right: Walter Carlson, Photophone operator (courtesy G. E. Co.), Pat Curran, Wm. Park, B. W. Reynolds, Rodney Doerr, Frank Bevan, Harry Carroll, H. M. Crawford, A. H. Miller, F. Aicher, R. Corbett (in truck), E. F. Perkins, A. M. Frost, Wm. P. Bear, F. U. Naylor.

Electrolux "Find the Buyer" Campaign is Announced

Electrolux Refrigerator Sales, Inc., Evansville, Ind., is sponsoring a "Find the Buyer" campaign plan, offering a dealer program of refrigerator sales activity for the spring months. The plan includes sales education, direct mail and window display features. An explanatory campaign portfolio has been brought from the press, describing the scope of the campaign, together with an explanation of how to order and use material for this spring sales work.

Included with this portfolio also is a series of three booklets comprising the company's new sales educational course.

Copies of the portfolio may be obtained from the company at Evansville.

Mueller Bulletin Describes Matched Units for Residences

L. J. Mueller Furnace Co., Milwaukee, Wis., recently brought from the press a brochure on "The Climator Air Conditioning System for Homes," describing the company's matched furnace and air conditioning units. Copies of the booklet may be had by writing to the company at Milwaukee.

Course in Flue Gas Analysis Completed by 85 Students

Eighty-five students in a flue gas analysis course conducted by Fort Worth, Tex., public school vocational department received certificates on completion of the course late in February. Over 110 students were enrolled in the course which was taught by Frank Jackson, industrial engineer for the Fort Worth division, Lone Star Gas Co.

May Enlarge Omaha Plant Before 1932-33 Winter Season

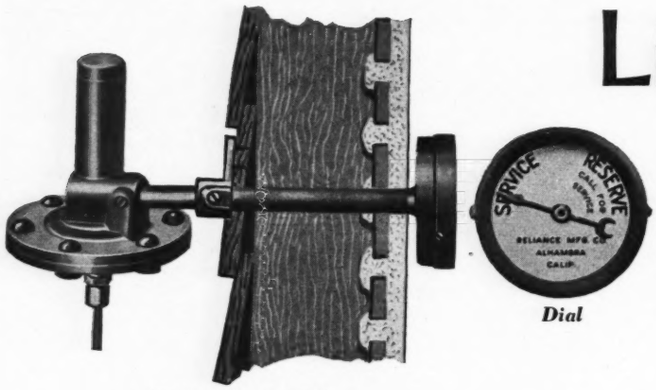
During the four coldest days in March, the city of Omaha consumed 37,956,000 cubic feet of gas, or almost the total capacity of the plant operated by the Metropolitan Utilities District. It is reported that the plant may be enlarged before another winter brings peak loads.

Service for Las Vegas, N. M. To Begin About September 1

September 1 is the date now set by Southern Union Gas Co. of Dallas, Texas, for beginning service in Las Vegas, N. M. A 65-mile, 8-inch line will be constructed by the company from the main line running into Santa Fe from Albuquerque.

RELIANCE

Liquid Petroleum Gas Regulators

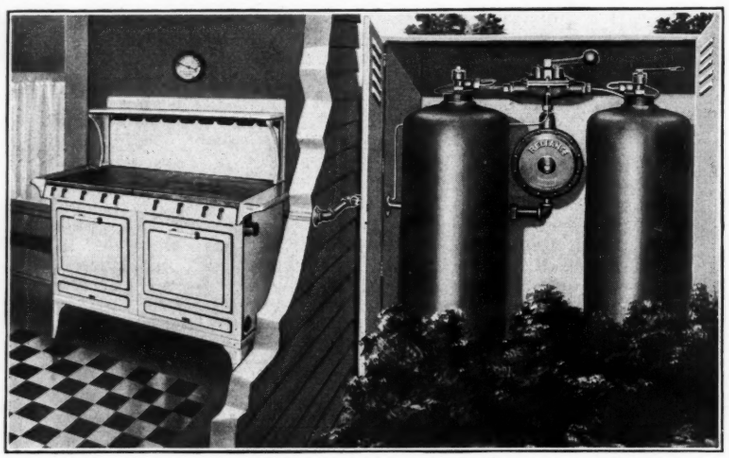


Dial

Indicator Assembly

For Absolute Pressure Control of Bottled Gases

This type of control not only guarantees extreme convenience to the consumer but also minimizes the possibility of interrupted service, guaranteeing a flow as constant and dependable as can be offered by any natural or manufactured gas company.

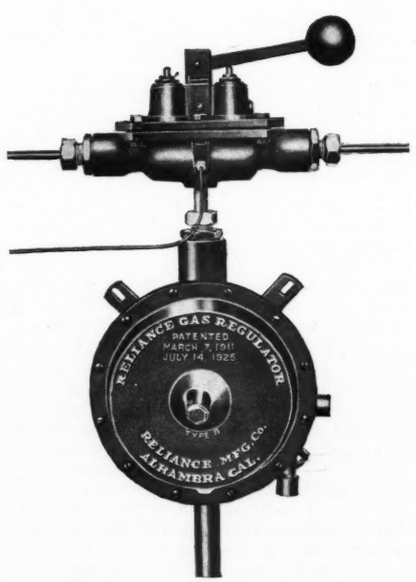


Completed Installation

- Automatic control
- Two step regulation
- Indicates cylinder operating
- Two cylinder operation for excessive demands
- Positive lockup
- Multiple cylinder installations

The type "MR" regulator is in reality a duplex regulator, reducing extremely high pressures encountered in the service cylinder when first installed, to a uniform outlet pressure varying from three to six pounds, thereby enabling the secondary, or Type "B" regulator, to work under normal, reasonable conditions at all times, insuring uninterrupted service to the appliances without pressure fluctuations.

Also a complete line of gas regulators for Manufactured and Natural Gas Services



Type MR and B Regulator Assembly

RELIANCE REGULATOR CORPORATION

ALHAMBRA, CALIFORNIA

SALES — SERVICE

NORTHWEST GAS & ELECTRIC EQUIPMENT CO., Portland, Oregon
AMERICAN METER COMPANY—New York, Chicago, Pittsburgh
JOHN J. GRIFFIN & COMPANY—Philadelphia
HELME & McILHENNY, Philadelphia
MARYLAND METER WORKS—Baltimore
WESTCOTT & GREIS, INC., Dallas, Texas; Tulsa, Oklahoma
D. McDONALD & COMPANY—Albany
METRIC METAL WORKS—Erie, Denver, Kansas City
NATHANIEL TUFTS METER WORKS—Boston
PACIFIC METER WORKS—Los Angeles, San Francisco
RELIANCE REGULATOR CORPORATION—Alhambra, Calif.

BUTANE - PROPANE NEWS

Covering Liquefied Petroleum Gas Service

Procedure for El Centro Change-Over from Oil Gas to Air-Butane

By R. L. HAYDEN

Manager Imperial District,
Natural Gas Corporation of California

WHEN Natural Gas Corp. of California recently completed its air-butane plant at El Centro, replacing oil-gas service, the necessary adjustment of all appliances to the new gas introduced conditions not encountered in the more usual natural gas change-over procedure, due to the amount of air already mixed with the gas before air-butane enters the burner throat.

A description of methods adopted to secure efficient appliance operation at El Centro may therefore be of interest.

R. L. Hayden

As can be seen from Fig. 1, manufactured gas requires less air to complete combustion than natural gas, while natural gas requires less than is necessary for the burning of pure propane and butane gas which ordinarily has a B.t.u. value of approximately 3200. During the carburetion process at the plant substantially five volumes of air are mixed with one volume of vapor in reducing the heat content of the gas to 550 B.t.u. per cubic foot. While practically the same proportion of additional air is required at the appliance as in the case of manufactured gas, the effect of the higher gravity of the air-butane is to entrain excessive quantities of primary air. Therefore, instead of changing the orifice design to insure the maximum amount of primary air, it is necessary to accomplish the opposite result.

The most satisfactory solution of this problem of adjustment has been found through the use of brass speed reducing tips or spuds. As shown in Fig. 2, these are designed to cut down the exit velocity of the flowing gas stream and change the location of the discharge in the mixing tube throat, thereby reducing the efficiency of the mixing tube as an air-inspirating device and making the accurate control of primary air more simple. Their construction also makes it possible for the adjuster to quickly cut them off where he finds they are eliminating too much air to give efficient operation in individual cases.

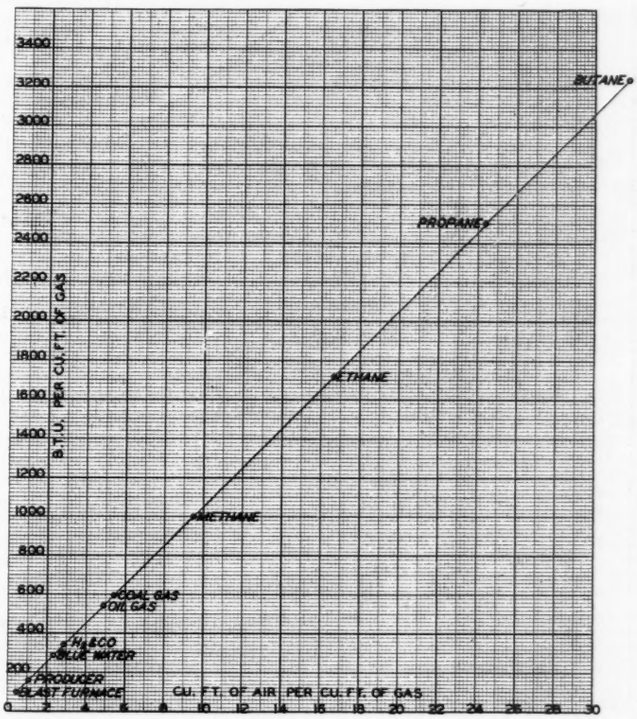


FIG. 1.

Curve shows amount of air required for complete combustion of various gases.

The rate of flame propagation of air-butane gas is approximately half that of ordinary manufactured gas, which makes it necessary to ream the ports of all burners; otherwise the exit velocity will be too great with the result that the flame will blow off and not remain ignited. In the case of new burners especially designed for air-butane gas, raised burner ports have been found advantageous because the longer port channel prevents flash back. From 3/16 to 1/4 inch are proving the most satisfactory thickness for practical use.

These speed-reducing tips have made possible the complete satisfactory adjustments of the oil manufactured gas appliances for air-butane gas in the El Centro district at a minimum expense to the gas company. For most space heaters, new burners had to be installed. In the majority of cases it was found sufficient to raise the burners of the water heaters.

Some sections of the El Centro distribution system are low pressure and this has made the accurate adjustment of all appliances more important than ever, as this new gas allows for very little variance in pressure at the burner. This is due to the fact that if the pressure is low, there is insufficient gas, while if the pressure is too high, it will blow the flame off the burner. Regulator adjustments have been made so as to maintain a pressure of approximately 7 inches at the appliance.

Flame temperature of the new air-butane gas is slightly lower than that of the oil manufactured gas, but the variance is so small as to make little appreciable difference in actual operation. The air-butane flame temperature is around 1600° F., compared to 1800° F. for manufactured gas, and is about equivalent to that of straight natural gas. It has been found by laboratory tests that the air-butane flame reaches its hottest temperature when it is burning a sharp blue flame

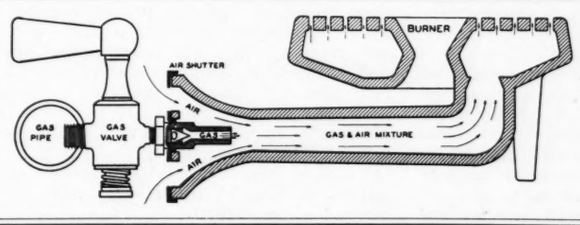
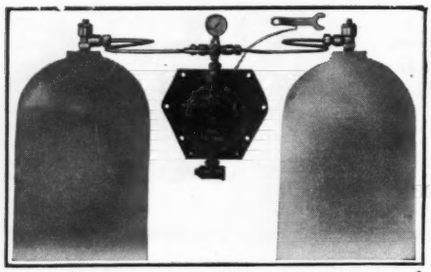


FIG. 2.

Illustrating burner changes necessary for efficient combustion of air-butane gas.



The Only COMPLETE Propane Gas CONTROL

A complete manifold and regulating unit, work tested and factory assembled . . . the only *complete* liquefied petroleum gas control assembly you can buy; fortunately Rego-made . . consists of connections to cylinders, a 2-way throw-over valve (to shut off one side automatically when the other is opened), a regulator, mercury seal, supply of mercury, wrench . . . complete and ready to install.

In One Package

The REGO complete manifold and control unit is factory assembled and tested under actual working conditions . . . then packed in a substantial re-shipping carton.

Ready to Ship
for
Field Installation

Sell the job . . . ship the equipment, including the REGO carton . . . then send a man out to hook it up. That's what REGO means to the Liquefied Petroleum Industry!

Write **We have a wealth of data on marketing. and distribution; complete files on research and application. Ask us any question without obligation.**

The
Bastian-Blessing Co.
254 East Ontario St.
Chicago, Ill.

with just a bare red tip, and adjustments have been made accordingly. The air-butane flame is much shorter than that of straight natural gas.

In advance of the change-over work, a complete survey of appliances in use in this district was completed in order to assure that all of the necessary material would be on hand for prompt adjustments. A great deal of experimental work was also carried on by Natural Gas Corp. of California to determine the various characteristics of this new gas, as compared to oil manufactured gas. From these tests it was found that appliances adjusted for manufactured gas could not be lighted with air-butane gas, as there was too much air being admitted at the burner. Therefore, to guard against any possible accident, all gas meters were turned off the day of the change, which is also at variance with the situation existing in the change-over from manufactured to natural gas. This necessitated a great deal of extra work and expense on the part of the gas company, which would have been eliminated had the gas been simply turned into the mains and the adjustment work started. However, this safety precaution made possible the completion of this work with no accidents of any kind. To minimize the inconvenience of consumers, the town was divided into eight sections of approximately 200 meters each and adjustments made in one section prior to the turning of the air-butane gas into another section. Regular procedure of the change-over crew on calls and call backs was followed throughout.

The major difficulty encountered in this work was the presence of water or condensation in some parts of the distribution system. Sectionalizing the system for the purpose of converting appliances frequently reversed the direction of gas flow, and this, together with the change in velocity and the condensation in the mains, made poor pressure conditions. For this reason many of the mains had to be cut and temporary drips installed. Condensates remaining in the mains after the conversion will of course disappear within a short period of time, as the air-butane gas is particularly dry.

All adjustment work at El Centro was carried on under the direction of O. F. Anderson of the Los Angeles Gas and Electric Corp., with H. N. Johnson in charge of commercial and industrial work. They were assisted by an especially trained crew of men secured from Los Angeles Gas and Electric Corp. and Coast Counties Gas and Electric Co. All these men had previously done considerable work in the change-over of appliances from manufactured to natural gas.

The El Centro plant of the Natural Gas Corp. of California is the largest air-butane plant on the Pacific Coast and was constructed under the direction of A. E. Hall, engineer for Standard Management and Operating Corp. The plant has a capacity of 60,000 cubic feet of gas per hour. There are two 15,000 gallon liquid storage tanks with 90,000 cubic feet of low pressure gas storage capacity and 45.000 cubic feet of high pressure storage. Plans now call for the probable addition of 50,000 additional cubic feet of high pressure storage tanks within the near future. This high pressure storage takes care of the high pressure system which is maintained in the commercial and part of the residential section of the community. The gas company also intends to gradually convert most of the El Centro system to high or intermediate pressure.

The new building is located on the site of the old manufactured gas plant and consists of a galvanized steel structure for the housing of the carbureting and control equipment. Gas served is of 550 B.t.u. value, its gravity being 1.17 as compared to about .65 for natural and .4 for manufactured gas.

The general design of the El Centro plant is the same as in use in other communities by Natural Gas Corp. of California, with the exception of the control equipment. At this plant the mixing is controlled by volume rather than heat unit control. With this type, the equipment is set for a certain percentage of air intake and a set percentage of vapor intake, according to the heat content of the butane vapor which is practically uniform at 3200 B.t.u. per cu. ft. in the liquid used by Natural Gas Corp. of California. Unlike the heat unit control, this unit is stationary until reset by hand, but as vapor supply is obtained by vaporizing liquid drawn from the liquid storage tank, no variation in B.t.u. of sendout is anticipated.

At the present time there are more than 1600 meters connected with the El Centro plant. The load reaches its peak during January and February and during this season an average of one carload of butane is used every five days. In the summer many residents leave the Valley and there are only about 1200 meters in use at that time. The almost complete automatic operation of this new plant will greatly reduce operating expenses and will assure consumers the best type of service during both peak and minimum load periods.

Skelgas Co. Sponsors Letter Writing Contest in Middle West

The Skelgas Co., Kansas City, Mo., is sponsoring a contest, wherein potential consumers throughout the middle west are asked to write a 300-word letter on "What Skelgas Would Mean to Me." The contest will close April 16, and the person writing the most satisfactory answer to this question will receive a new gas range, water heater, and a complete Skelgas installation with 25 cylinders of Skelgas. In addition to the first prize, 65 other complete installations and stoves will be awarded, as well as 235 minor prizes. The accompanying illustration shows the type of advertising being placed in newspapers throughout the middle west in the interest of the contest.

ENTER OUR SKELGAS CONTEST
300 PRIZES VALUED AT
$12,500.00
for letters on
"What Skelgas Would Mean To Me"
FIRST PRIZE
IT IS so easy to enter our Skelgas contest. There's nothing to buy. All you have to do is write a letter of 300 words or less on "What Skelgas Would Mean to Me". Writing ability is not necessary. It is what you say that counts. Skelgas has so many advantages that it is very easy to write about.
65 NEW STOVES
There are plenty of prizes, 300 of them, including 65 new stoves with a supply of Skelgas for each stove. See the big list of prizes shown at left. It is so easy for you to win a prize in this contest, because there are so many prizes to be won.
You don't need any help to enter this contest, but we have a four-page Skelgas newspaper which is yours for the asking. It tells about Skelgas and contains the letters of people who are already using it.
WHAT IS SKELGAS?
Skelgas is the very heart of rich, natural gas. Clean and intensely hot burning, sootless and odor-free, it is used for cooking, water heating and lighting. It is real gas for all those who live beyond the gas mains.
Contest Closes April 16th. It's easy to write a winning letter. Read the rules, write your letter, and send it to the Contest Editor, Skelgas Company, 2334 Madison Avenue, Kansas City, Mo.
THE RULES:
1 Each letter shall be written about "What Skelgas Would Mean to Me."
2 Write not more than 300 words. Elaborate presentations will not be counted in your favor, as neat presentation in plain, simple language, on one side of paper, will be given preference. Write your letter in ink or on one typewriting, and, at the end of your letter,
3 Anyone is eligible, excepting employees and family of employees of Skelgas Company, Skelly Oil Company, Skelgas dealers, and company's advertising agency.
4 Your letter must be postmarked before midnight, Saturday, April 16, and mailed to Contest Editor, Skelgas Company, 2334 Madison Ave., Kansas City, Mo.
5 In event of tie, each tying contestant will receive the full amount of award.
6 In case of tie, each tying contestant will receive the full amount of award.
SKELGAS
The Compressed Natural Gas
LISTED AS STANDARD BY UNDERWRITERS' LABORATORIES
GET YOUR "SKELGAS CONTEST NEWS" HERE

This "copy" announced the Skelgas contest.

Bottled-Gas Program for Mexican Cities Launched

FORMATION of the Gases y Combustibles, S. A., with headquarters in Mexico City, to carry through an extensive liquefied petroleum gas distribution program in Mexico, was announced in March. The Mexican government holds an important interest in the enterprise.

E. Valle Cambre, consulting engineer of Mexico City, is general manager of the corporation, with J. T. Parades representing the Control de Administracion del Nacional—the government interest. E. D. Taylor of Los Angeles represents the company in the United States.

A carload shipment of ranges, water heaters, and bottled gas cylinders is being made to Mexico early in April from Los Angeles. Following test use of the appliances in Mexico City, it is planned to extend bottled gas service there, and eventually to construct a number of central plants at strategic points in Mexico City. Distributing points for both bottled gas and central plant service will also be located in several important centers of the country. West Coast towns to be reached by shipment of butane-propane from California include Guaymas, Acapulco, Manzanillo, Mazatlan, and possibly Guadalajara.

Initial service will probably be to government institutions, larger haciendas, with gradual extension to general use where this proves economically feasible.

Contract for liquefied petroleum gas supply has been let by Gases y Combustibles, S. A., to Petrolane, Ltd., Long Beach, Calif. C. E. McCartney, general manager for Petrolane, has been retained as consulting engineer by the Mexican company. He plans a trip to Mexico City in April.

Mexico's deforestation problem is one factor behind this liquefied petroleum gas program. General use of charcoal for fuel purposes is endangering timber supplies and water sheds, and as a result the government is on the lookout for a charcoal substitute.

Sale of Utilities Gas & Electric Co. Properties Reported

R. C. Douglas of Chicago is reported to be purchasing either wholly or in part certain of the butane central plant properties owned by Utilities Gas & Electric Co. of Chicago. The plant at Waupaca, Wis., operated by The Central Wisconsin Gas Co., a subsidiary of Utilities Gas & Electric, and the Tennessee Gas Co., were reported involved in the transaction. Tennessee Gas Co. operates central butane plants and systems in 11 towns in the Southern states, including Murfreesboro, Maryville, Columbia, Union City, Morristown, Shelbyville, all in Tennessee, and Hendersonville, N. C., Gaffney, S. C., and Gainesville, Georgia.

It is reported that the southern plants will be operated under the name of the Tennessee Gas Co.

Plants to Be Used for Stand-By on Advent of Natural

Central States Electric Co., Cedar Rapids, Iowa, will use its butane plants at Clarinda and Missouri Valley, Iowa, as standby service in the event that natural gas is turned into the mains. At the present time no definite arrangements have been made as to time of the change-over, but that these towns will eventually be on "natural" is assured.

SCAIFE

I. C. C. CYLINDERS

A majority of distributors of Liquefied Petroleum Gas now use the Scaife cylinder.

SAFE

ECONOMICAL

GOOD LOOKING

FOUNDED 1802

WM. B. SCAIFE & SONS CO.

Oakmont, Pa. (Pittsburgh District)

New York Pittsburgh Chicago

May Supply Liquefied Gas in Ohio Communities

According to recent press reports, the Paramount Gas Utilities Co., Columbus, Ohio, plans to install 2,000 liquefied gas plants in rural sections of Ohio. A small gas generating plant will be installed on the customer's premises, supplying also neighboring consumers. It is estimated that the total cost of the 2,000 plants would be somewhere around $425,000.

Service for Tavares, Fla.

Florida Gas Co., Eustis, Florida, plans to extend service to Tavares, Fla., from the butane plant at Eustis, which already serves Mount Dora and Umatilla.

Eastern Shore Gas Co. Extending Service to Chincoteague

Eastern Shore Gas Co., Pocomoke City, Md., has begun installation of a propane plant and distribution system in Chincoteague, Va., with service expected to begin about the 15th of April. Later, the company expects to extend propane service to Princess Anne, Md.

Marshall, Minn., May Have Municipal Butane System

Lewis S. Hoffman is circulating a petition for the establishment of a municipally owned butane gas system in Marshall, Minn. The plant, according to Mr. Hoffman, would be used for stand-by service in the event that change-over to natural gas is made.

Connelly Iron Sponge & Governor Company

Automatic Balance District
High or Low Pressure
Back Pressure Valves
Photometers Testers
Siphon Pressure Gauges
Telemetric Gauges
Street Dep't Requisites
Lockwood Safety Valves
Gas Works Equipment
Gas Screens
Gas Tape
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Caloroptic Calorimeter
Counter-Balance Man Hole Cover
Safety-Syphon Seal

BACK PRESSURE VALVE
1/2" TO 36"

Write for Bulletins

ELIZABETH NEW YORK
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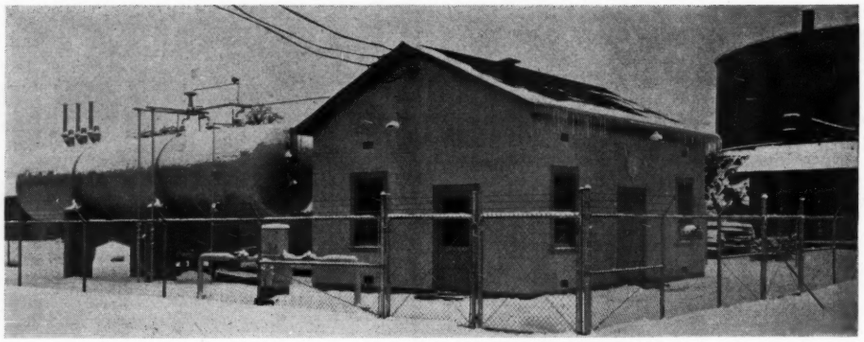


Winter view of Natural Gas Corp. of Oregon's butane plant at The Dalles.

Butane Plant at The Dalles in Service

THE most recent air butane gas plant to be completed on the Pacific Coast is that of the Natural Gas Corp. of Oregon at The Dalles, Ore., which was placed in operation recently. It is the sixth plant of its type to be completed in Oregon by the company.

The plant at The Dalles is generally similar in construction to those of the company at Klamath Falls, Bend, La Grande, Coquille and Cottage Grove, the first of which was placed in operation in January of 1931. Approximately 500 consumers have signed for the new service.

All construction was carried on under the direction of Standard Management and Operating Corp., with J. H. Lane in charge as resident engineer.

A complete gas appliance display is maintained by Natural Gas Corp. of Oregon at The Dalles, with active support by various dealers in the community. P. C. Rollins has been appointed representative of the company and is in charge of all sales activities.

Chattanooga Gas Co. Building Butane Plant at Fayetteville, Tenn.

Chattanooga Gas Co., Chattanooga, Tenn., is completing a new plant for the distribution of butane gas in Fayetteville, Tenn. The company has been supplying Fayetteville with natural gas for the past year, the gas being brought from a field about 12 miles east of the town. The pressure at the source has been gradually decreasing according to A. J. Goss, manager for the company, and it was thought advisable to install a butane plant with which to take care of the consumers in case the natural gas supply gives out.

The plant is nearing completion, and is of sufficient capacity to take care of a community of 5,000 population.

Fayetteville Natural Gas Gas., a subsidiary, serves the gas.

American Gas Construction Co. Taking Franchises in Minn. Area

American Gas Construction Co., Minneapolis, Minn., has secured gas franchises in Hutchinson, and Montevideo, Minn., and is reported to be applying also in Little Falls, Madison, Anoka, and Marshall. According to news releases, the company plans to construct plants for the service of liquefied petroleum gas in these towns until the arrival of natural gas. The towns are all on a proposed route for a major carrier from the Montana fields.

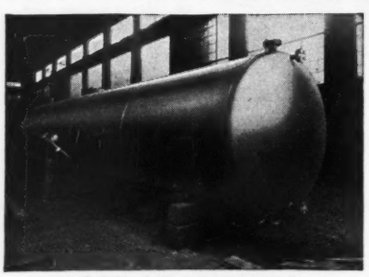
Marion, Iowa, May Have Butane Plant; Survey Under Way

Clark E. Jacoby of the Jacoby Engineering Co., Kansas City, Mo., has begun a survey of the town of Marion, Iowa, to ascertain the advisability of establishing a municipal butane plant in the town. A report is expected in about a month.

Bill to Tax Gas Defeated

A bill introduced recently in the Kentucky Legislature at Frankfort, to tax gas production was defeated on March 10 after a brief discussion.

.Biggs. Welded Vessels



WELDED BUTANE RECEIVERS

BIGGS Welded Butane Receivers effect a real economy by eliminating the maintenance trouble and expense usually encountered under severe working conditions. The Biggs weld is ductile, uniform, and stronger than the plate itself. Data upon request.

THE BIGGS BOILER WORKS CO., Akron, Ohio

KEROTEST
tested and proved
FORGED BRASS
VALVES,
MANIFOLDS
and FITTINGS
for
PROPANE
BOTTLED GAS
SERVICE

Write for descriptive circular

KEROTEST MFG. CO.
PITTSBURGH, PA.

KEROTEST

Second Edition of "American Gas Practice" off Press

AMERICAN Gas Practice, Volume I, 969 pages, on the production of Manufactured Gas has been brought from the press in its second edition. The book is by Jerome J. Morgan, M.S., Ph.D., associate professor of chemical engineering at Columbia University, with advice and suggestions by A. E. Forstall, consulting engineer of New York; J. A. Perry, assistant vice-president, United Gas Improvement Co., Philadelphia; F. C. Weber, assistant vice-president, The Brooklyn Union Gas Co., Brooklyn, N. Y.; and W. S. Yard, vice-president, Pacific Gas and Electric Co., San Francisco, Calif.

In this second edition a slight change has been made in the title, being called "American Gas Practice" rather than "Manufactured Gas". The change does not influence the contents of the first volume, which like its predecessor deals with the production of manufactured gas. The effect of the title change will apply in the second volume in which it is proposed to treat the "Distribution and Utilization of City Gas", including also natural gas after it has been brought to the city gates.

Material introduced in this second edition includes four new chapters dealing with the following subjects: Natural Gas, Reforming of Hydrocarbon Gases, Liquefied Petroleum Gases in Gas Production, and Gas Conditioning.

Further new sections have been added, or extensive additions made to existing sections, discussing: Chemical Composition of Coal, Testing of Coals for Gas Making Purposes, Factors Influencing the Yield and Quality of Coke, Sulfur in Coal Carbonization, Vertical Chamber Ovens, Heat Transfer in Carbonization, Dry Quenching of Coke, Power for Driving Gas Making Machinery, Alkalinity and Acidity of Boiler Waters, Thermal Relations in the Blue Gas Reactions, Mechanical Grates for Water Gas Generators, Characteristics of Carburetting Oils, Methods of Computing Oil Efficiency, Evaluation of Carburetting Oils, Steam Decomposition in the Water Gas Generator, Carburetting with Heavy Fuel Oils, The New Jones Oil Gas Process, Dayton and Faber Oil Gas Processes, Heat Transfer in Condensing, Designing Scrubbers from the Heat Transfer Standpoint, Evaluation of Oxide Purifying Materials, Humidity Control in Oxide Purification, Peak Load Gas Equipment, and Future Problems as Indicated by the Engineering and Economic Survey of the Gas Industry.

New Orleans Public Service Inc. Opens Home Service Dept.

New Orleans Public Service Inc., New Orleans, La., has announced the opening of a new Home Service Department with Mrs. Eva Pender as director. Activities of the department began on March 15 with a course in cooking demonstrations which will continue meeting on each Tuesday afternoon from 2 to 4 p. m.

For several years Mrs. Pender was extension agent for Louisiana State University, later becoming director of educational advertising for the Southern California-Arizona Association of Ice Industries. She also served as acting director of the Home Service Department of the Southern California Edison Co., Los Angeles, Calif.

Service for Mendota, Ill. Soon

Gas from the main line of the Natural Gas Pipeline Co. of America will soon serve Mendota, Ill. Illinois Northern Utilities Co. is reported planning the construction of a 10-mile, 3-inch lateral to serve the town.

Interesting Sessions Planned for A. G. A. Distribution Conference April 6-8

THE Conference of the Distribution Committee, Technical Section, American Gas Association, scheduled for April 6-8 at Birmingham, Ala., promises to be an outstanding success with papers and addresses stimulating a great deal of interest, as shown in the following program for general sessions:

Wednesday, April 6

9:40 A. M. Tutwiler Hotel

Opening Remarks: F. A. Lydecker, Chairman, Distribution Committee.

Welcome to Birmingham.

Report: Cast Iron Pipe Standards Committee—C. C. Simpson, Jr., chairman, Consolidated Gas Co., of New York, New York, N. Y.

Symposium

Giving Good Distribution Service to Customers—H. B. Andersen, Philadelphia Gas Works Co., Philadelphia, Pa.

Receiving and Dispatching Customers' Service Calls—H. L. Gaidry, New Orleans Public Service Inc., New Orleans, La.

Servicing Automatic Appliances—T. J. Perry, The Brooklyn Union Gas Co., Brooklyn, N. Y.

Domestic Appliance Maintenance Service—C. R. Miller, Portland Gas & Coke Co., Portland, Ore.

Open Forum

2:00 P. M.

Report: Pipe Joints Committee—H. W. Battin, chairman, The United Gas Improvement Co., Philadelphia, Pa.

Paper: Pipe Joint Research at A. G. A. Laboratory—K. R. Knapp, A. G. A. Testing Laboratory, Cleveland, Ohio.

Symposium

Welding Procedure For and Physical Characteristics Of Arc Welded Pipe Joints—O. A. Tilton, General Electric Co., Schnectady, N. Y.

New Developments, Joint Characteristics and Procedure Specifications for Oxy-Acetylene Welding of Steel Pipe—T. W. Greene, The Linde Air Products Co., New York, N. Y.

Pipe Line Welding—R. S. Fuller, Pacific Gas and Electric Co., San Francisco, Calif.

Copper Pipe for Gas Distribution—Arthur F. Bridge and Frederic A. Hough, Southern Counties Co., Los Angeles, Calif.

Open Forum

Thursday, April 7

9:30 A. M.

Inspection Trip.

8:00 P. M. Tutwiler Hotel

Report: Subcommittee on Conversion from Manufactured to Natural Gas—Geo. Wehrle, chairman, Public Service Company of Colorado, Denver, Colo.

Paper: Changeover from Manufactured to Mixed Gases in Chicago—W. J. Buckley, The Peoples Gas Light and Coke Co., Chicago, Ill.

Paper: Distribution Design as Related to Customers' Supply—Walter M. Russell, Washington Gas Light Co., Washington, D. C.

Friday, April 8

9:30 A. M.

Report: Subcommittee on Meters—J. E. Overbeck, chairman, Columbia Engineering and Management Corp., Columbus, Ohio.

Paper: Economics of Removing Locked Meters from Consumers' Premises—T. N. Spencer, Philadelphia Gas Works Co., Philadelphia, Pa.

Paper: A Study of the Economics of Householding Load—Raymond A. Ransom, Henry L. Doherty & Co., New York, N. Y.

Open Forum

2:00 P. M.

Report: Subcommittee on Lost and Unaccounted For Gas—J. M. Pickford, chairman, Midland United Co., Chicago, Ill.

Report: Subcommittee on Pipe Coatings and Corrosion Research—J. K. Crowell, chairman, S. R. Dresser Manufacturing Co., Bradford, Pa.

Presentation: Accomplishments in Determining Soil Corrosiveness — Dr. Scott Ewing, Research Associate, U. S. Bureau of Standards, Washington, D. C.

Paper: Determining the Performance of a Coating Without Disturbing a Gas Line —R. J. Kuhn, New Orleans Public Service Inc., New Orleans, La.

Open Forum

Aside from the daily routine of conference presentations and lengthy discussions, there will be an interesting inspection trip to the pipe foundries in Birmingham. A very complete tour has been arranged, beginning at the Tutwiler Hotel in the early morning, consuming the entire day. A noon-day barbecue will be prepared for the delegates attending this trip and entertainment will be provided by local colored talent.

Decision Re. City Gate Rates to Affiliated Distributing Companies

As an outgrowth of a rate case in the Kansas courts between the Western Distributing Co., a Cities Service subsidiary, and the Public Service Commission of Kansas, a decision was handed down the first week in March by the U. S. Supreme Court which will bring the operations of interstate pipe line companies selling to affiliated distribution companies under the jurisdiction of state public service commissions so far as those operations concern rates charged at the city gate for gas and electric service.

The court held that in an instance of interlocking directorates or other evidence of corporate relationship between a pipe line and a distributing company, the latter must offer satisfactory proof of all costs before obtaining a rate increase.

The BARTLETT HAYWARD CO.

Designers and Builders

GAS HOLDERS

COMPLETE COAL GAS, CARBURETTED WATER
AND BY-PRODUCT PLANTS
SALT WATER and FRESH WATER CONDENSERS
PURIFIERS, STEEL TANKS, FELD VERTICAL SCRUBBERS

Main Office and Works
Baltimore, Md.

Lincoln Building
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METTLER AUTOMATIC SAFETY PILOT

PILOT LIGHT
CHANGEABLE ORIFICE ANY KIND OF GAS
AUXILIARY PILOT AND ELEMENT HEATER
BIMETAL TWO OR MORE PIECES REVERSED FOR COMPENSATION.
OUTER SAFETY COVER
BUNSEN TUBE MIXER
SILVER ALLOY CONTACTS REQUIRING NO ADJUSTMENT
ELECTRIC TERMINALS
GAS SUPPLY

THIS NEW, SIMPLE, COMPACT SWITCH
MAKES OR BREAKS CIRCUIT WITHIN
30 SECONDS

Satisfaction Guaranteed

SENT ON 10 DAYS' TRIAL. FOR TEST WE WILL PAY
TRANSPORTATION BOTH WAYS.

110 volt
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Mettler Entrained Combustion Gas Burners
FOR ALL Purposes Kinds of gas Pressures
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REGULATORS & GOVERNORS

Complete Line of Regulators for

Natural, Manufactured, Butane and Propane Gas

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GROBLE GAS REGULATOR COMPANY

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For Power Plant and Industrial Uses

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FORNEY COMBUSTION ENGINEERING CO.

513 CENTRAL BANK BUILDING, DALLAS, TEXAS

Distress Oil

(Continued from Page 24)

in the fuel oil market in a given locality. This naturally brings to mind this question: What are the best methods of meeting this competition?

Let us stipulate that general price reduction by the major oil companies can only be met by corresponding reduction in the price of gas, preserving a due differential to account for the added operating economies, flexibility and cleanliness of gas. These are real assets in a plant and most consumers are willing to pay an appreciable premium for them. However, we must recognize that a general deflation of prices is in progress and logically, the selling price of gas must follow that of other commodities.

The Class 2 oil is perhaps the most dangerous competitor for the boiler load, particularly in the smaller plants. The price differential is quite marked and the comparative stability and responsibility of the companies marketing fuel in this bracket removes most of the disadvantages attendant upon purchase of the Class 3 or distress oil. More than half of the loss in revenue ascribed to oil in the investigation mentioned may be traced to oil of this price range. However the measures which have been found to be most effective for this oil are also those which are most effective against the Class 3 or distress oil and the question of meeting the competition of these two classes will be discussed under one head.

The meeting of true distress oil on a purely competitive basis is out of the question. Fortunately, the sporadic and temporary nature of this competition is such as to make its conquest an easier problem. The control of production and restriction of drilling make it seem less likely that the conditions that prevailed at Venice will be repeated. It does not seem likely that oil will be sold at prices of 25c to 50c per barrel for any great period of time in the future. Such ruinous prices will be met only in certain special conditions.

One of the most effective methods of meeting this condition has been found to be inclusion of two features in industrial contracts:

First: A contract for a period of one year or more.

Second: A clause whereby the customer agrees to use gas exclusively for his fuel requirements.

One of the strongest points against the use of distress oil is the usual inability of the producer to assure future deliveries. Good business practice requires budgetary control which can not be assured if distress oil is used as fuel. The one year feature has presented little or no difficulty and has been found effective in settling the consumer's mind as to his plans for fuel at his plant for a definite period of time.

Oil of any analysis, even of the best, has a more harmful effect on refractory materials than natural gas. High sulphur oil has a corrosive action on steel when conditions are such as to permit the formation or condensation of water vapor, as during operation at low loads or intermittent use of the plant The additional investment required in storage and burner equipment, the expense in labor and power for the burning of oil, depreciation and maintenance, form powerful sales arguments.

The burning of oil—any oil, and more particularly oil of low gravity—is considerable of a problem. Effort, time and expense are required to place this oil in condition to burn. The natural tendency of a human being is to do things in the easiest way. This tendency should be cultivated to the fullest

FAVORED FOR DIFFICULT INSTALLATIONS

WHEN a particular make of pipe is entrusted so generally with the steady transmission of valuable gas across deep rivers, treacherous swamps, troublesome bayous and over rugged mountains, you can be sure that pipe line engineers have an extra measure of confidence in its ability to make good.

NATIONAL Pipe has won this greater confidence—through the years—by constantly and consistently proving its particular fitness for every kind of difficult pipe-laying condition. Both over land and under water... its great strength, uniformity and ductility have succeeded in meeting every requirement.

If you want pipe that is easy to join, economical to lay, and extra worthy for difficult installations... specify NATIONAL—

America's Standard Wrought Pipe

NATIONAL TUBE COMPANY · Pittsburgh, Pa.
Subsidiary of United States Steel Corporation

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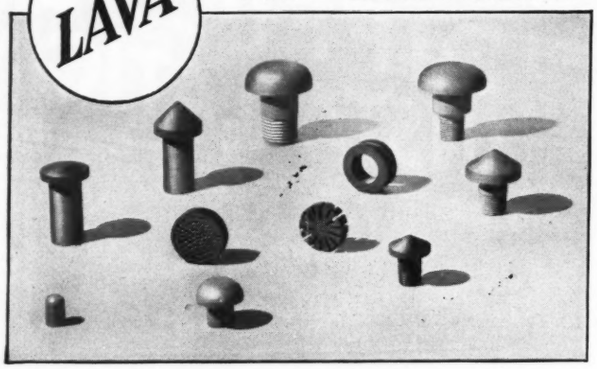
NATIONAL PIPE

LAVA is NON CORROSIVE NON CORBONIZING



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Manufacturers of Heat Resistant Insulators

HOFFMAN

In thirty-three years of intensive engineering development The Hoffman Automatic Gas Water Heater has reached the utmost peak of economical consumer satisfaction.

Write for Profitable Detailed Information.

The Hoffman Heater Co.

1701 Dixie Highway
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MUELLER
GAS ERA
BOILERS

fill the most exacting demands for thoroughly dependable and economical gas-fired steam and hot water heating equipment.

For details, write:

L. J. MUELLER FURNACE CO.,
334 S. 2nd St., Milwaukee, Wis.

Makers of a complete line of gas-fired boilers and pressed steel and cast furnaces

extent by pointing out the comfort, ease and convenience of a gas-fired installation.

More and more the sale of gas for industrial purposes requires adequate technical knowledge on the part of the salesman, together with a disposition to be helpful. The industrial customer must be shown that the utility is interested in the solution of his fuel problems.

The real answer to distress oil, as with most other forms of competition, is salesmanship and confidence in natural gas.

New Stock Set-Up for Minneapolis Gas Light Co.

Issuance of participation units by the Minneapolis Gas Light Co., Minneapolis, Minn., to be exchanged for preferred stock of the American Commonwealths Power Corp., has been approved by the Minnesota Securities Commission. Stockholders who purchased shares in the Commonwealths Power Corp., through the Minneapolis company will be eligible for the participation units, 25,000 of which will be issued. The plan provides for establishment of a retirement fund so that the units may be taken up at par value of $100 before 1950. Court actions against the company on the ground that its securities were misrepresented have been dropped.

Minneapolis Gas Light Co. is a subsidiary of the American Gas and Power Co., the control of which was purchased by A. E. Fitkin in January of this year from the receivers of the American Commonwealths Power Corp. There is no reorganization of either the American Gas and Power or of the Minneapolis company contemplated, according to F. W. Seymour, president of the former company, as both companies are in good financial condition and their operations are being carried on as they were under the previous ownership.

Bastian-Blessing Offers New Treatise on Welding

The Bastian-Blessing Co., 240-258 East Ontario Street, Chicago, announces publication of a new booklet, the title of which is "Proof Plenty," featuring the advantages of welded pipe. Case histories are given to show how certain organizations have overcome specific problems; these are condensed and illustrated so as to be of value to the welding shop designer, foreman or welder.

Copies of the booklet are available by addressing the Bastian-Blessing Co.

James M. Kobabe to Represent Mettler in Chicago Area

The James M. Kobabe Co., combustion engineering firm, has established an office in the Peoples Gas Building, Chicago, Ill., to represent the Lee B. Mettler Co., manufacturer of Mettler entrained combustion gas burners, headquartered at Los Angeles, Calif. A complete stock of Mettler devices will be available.

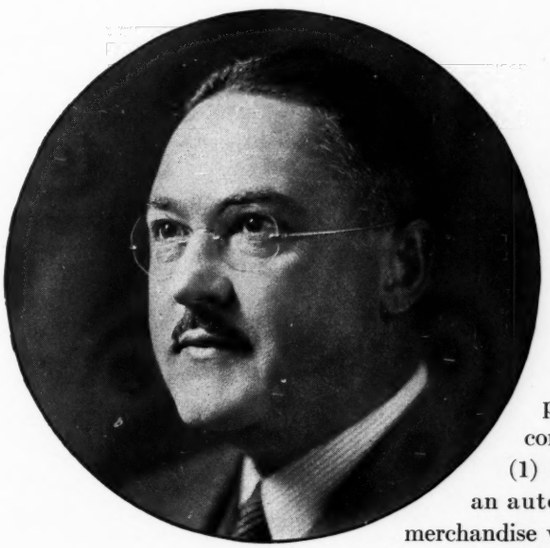
The Kobabe company has represented the Lee B. Mettler Co. in midwestern territory from the Kansas City office for about four years.

J. W. Coons Named Manager of P. G. and E.'s Humboldt Division

J. W. Coons has been named manager of the Pacific Gas and Electric Co.'s Humboldt Division, with headquarters at Eureka, Calif. He succeeds R. G. MacDonald, resigned. Mr. Coons was for several years manager of the Yolo district for the company.

"Electrolux

has earned the enthusiastic support of the GAS INDUSTRY because of its *splendid performance*"



Thus writes Mr. H. R. STERRETT, Vice President and General Manager of the New Haven Gas Light Company

TWO THINGS make Electrolux of vital importance to every gas company:

(1) Electrolux gives you an automatic refrigerator to merchandise which, in 5 years' practical test in more than 250,000 homes and apartments throughout the country, has proved itself second to none in *performance.* Unlike every other automatic refrigerator on the market today, Electrolux produces constant cold *without machinery;* with no intermittent stopping and starting of the chilling process.

(2) Every Electrolux you install adds 1500 cu. ft. to the monthly load. It takes the small convenience user out of the non-profit class, and is often the means of saving the whole cooking load.

But that's not all. Because Electrolux is so outstandingly *modern*, it publicizes the up-to-dateness of gas as a fuel. This builds new prestige for your company, and gives a strong impetus to the sale of other gas-using appliances.

To assist you in merchandising and selling Electrolux in your territory, we've prepared just the material you'll need to initiate, follow up and close profitable Electrolux sales. Plan now to boost your MCF's with Electrolux. Write for information and details to Electrolux Refrigerator Sales, Inc., Evansville, Ind.

ELECTROLUX

THE *Gas* REFRIGERATOR

X th OLYMPIC GAMES 1932 LOS ANGELES

READERS of WESTERN GAS

MAKE USE OF OUR OFFICES as headquarters during your visit to the Olympic Games.

YOUR MAIL may be forwarded in our care.

USE OUR FREE stenographic and telephone service.

HOTEL RESERVATIONS and sight seeing trips planned for you.

MEET YOUR friends here.

124 West 4th Street
Los Angeles

Stop at San Francisco on your trip to or from the Olympic Games. The same facilities are offered you at the San Francisco office of WESTERN GAS—447 Sutter Street—San Francisco

WE'LL BE GLAD TO SEE YOU.

COMPLETE . . .
WATER TREATMENT
. . . . . SERVICE . .

Increasing pressures and increasing rates of evaporation demand scientific chemical exactness in meeting the boiler problems arising in steam production. It is a task for specialized chemists and engineers.

The Dearborn Chemical Company has long recognized the importance of individual chemical treatment and constant laboratory control to meet the requirements of water and operating conditions. Only by strict adherence to this standard has Dearborn service remained the complete Water Treatment service. Inquiries invited.

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BURNERS
FOR ALL REQUIREMENTS
NEMEC combustion ENGINEERS
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COMPANY
71 West 35 Street, New York, N. Y.
REFRACTORIES
FOR GAS APPLIANCES

Genceraco Refractories are made in all shapes and sizes, in color, decorated or plain and in any quantity. They may be had in dense as well as porous material.

Extremely resistant to thermal shock and are physically strong. We will gladly send you a quotation on your requirements.

Vance to Head Wholesale Sales Dept. for Payne Furnace & Supply Co.

J. L. Vance

J. LYLE VANCE has been named manager of the wholesale sales department for the Payne Furnace & Supply Co., Beverly Hills, Calif. Mr. Vance was with Southern Counties Gas Co. at Los Angeles in domestic and industrial gas and appliance sales departments. Following two years as a gas furnace salesman he served as sales and advertising manager for the Payne company; and three years ago he was placed in charge of the Natural Gas Bureau Industrial Equipment exhibit in Los Angeles, a cooperative sales activity of the Southern California Gas Co., Southern Counties Gas Co. and the Los Angeles Gas and Electric Corp.

United Gas Public Service Co. Announces Personnel Changes

Several changes in the district office personnel have been announced by the United Gas Public Service Co., Houston, Texas.

W. C. Merritt, formerly manager for the company in the Marshall, Texas, office, will take over the managership at Beaumont, replacing W. B. Currey, who leaves to take an executive position in another city.

W. R. Briggs, formerly at Beaumont, has been appointed district manager at Kenedy. Under a recent reorganization plan, the Kenedy office will be headquarters for United Gas Public Service Co. in Falls City, Floresville, Karnes City, Nordheim, Pleasanton, Poth, Runge and Yorktown, as well as Kenedy.

E. L. Colvin, manager at Crockett, Texas, has been transferred to Nacagdoches as manager there. Clem Peded has been placed in charge of the Crockett office.

The office of the company at Marshall, Texas, has been redecorated and rearranged, according to W. H. Langston, district manager.

Headquarters of Central Illinois Public Service Co. Moved to Quincy

The stockholders of Central Illinois Public Service Co., are reported have approved plans to designate Quincy, Ill., as company headquarters instead of Springfield, Quincy having put that provision in the 40-year franchise granted to C.I.P.S. Co., to serve natural gas there. Operating offices will remain in Springfield when Quincy officially becomes headquarters. There will be no personnel changes.

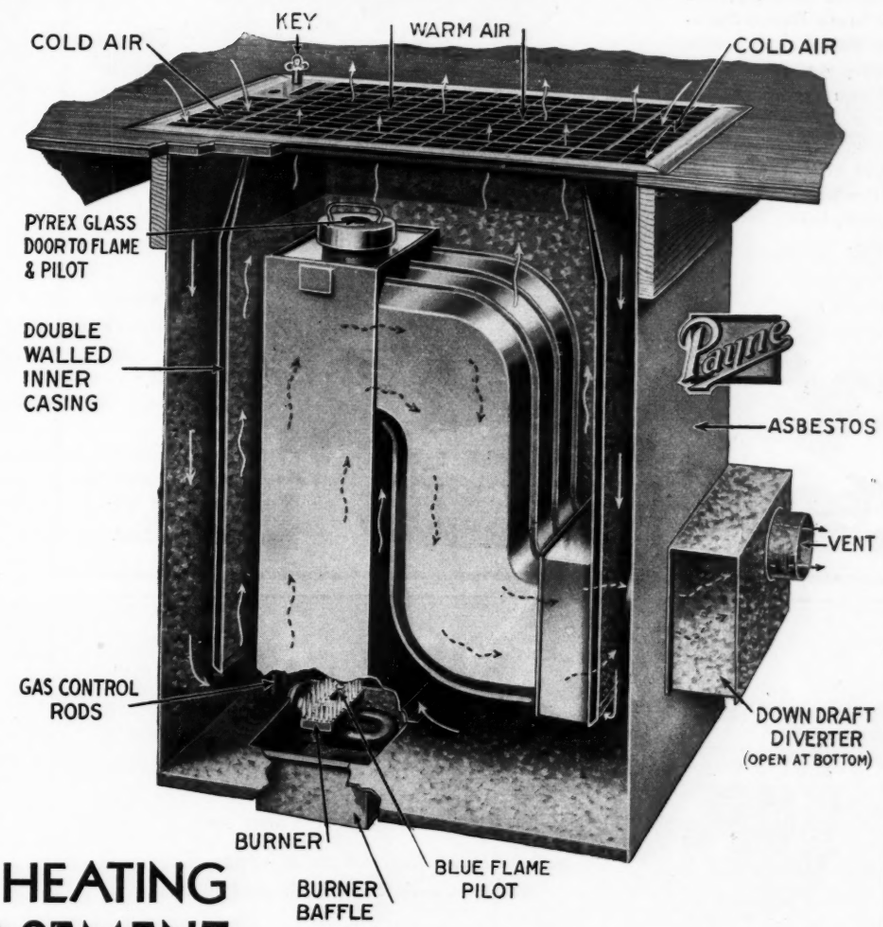
Barber Burner Co. of Calif. Formed in San Francisco

The Barber Burner Co. of California has recently been formed by Noble H. King and Marshall McGrath of San Francisco to represent the Barber Burner Co. of Cleveland, Ohio, throughout the entire California territory. Offices will be maintained in San Francisco and Los Angeles.

Grants Rights to Stockholders

Kentucky Gas Transmission Corp., Catlettsburg, Ky., late in February granted rights to stockholders to subscribe for additional stock of the corporation.

PAYNE
FLOOR FURNACES



Winter's Substitute for Summer's HEAT!

THE PAYNE FLOOR Furnace uses gas—the cleanest, most dependable and most efficient of all fuels. Gives ideal summer heat indoors. Endorsed by thousands of users everywhere!

NO MORE COLD FLOORS • • No Sweating of Windows

THE PAYNE Floor Furnace circulates fresh pure warm air in every nook and corner, keeps floors warm! Free from smoke, fumes and vapors!

WARM AIR HEATING Without a BASEMENT

PAYNE FLOOR FURNACES have been tested and proved in the crucible of time. Durably constructed. Easy to install and operate. Completely welded heating element. Heating efficiency, burner operation, safety, construction and performance have been approved by the American Gas Association—and by thousands of happy and enthusiastic users.

Every PAYNE FLOOR FURNACE installation is a friend-maker and a sure "repeater". No forced selling to put this item over. A sales success for sixteen years.

Write Today for Details of Dealer Franchise!

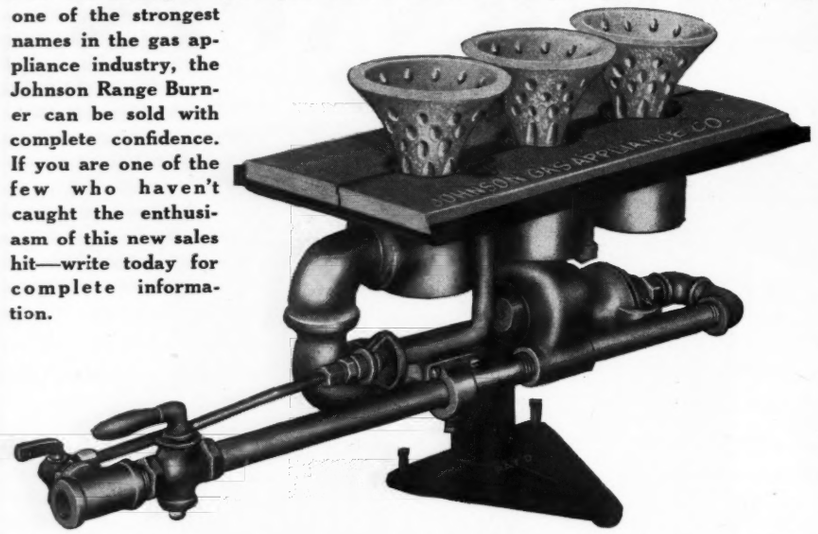
Payne

PAYNE FURNACE & SUPPLY CO. Beverly Hills, California

THERE IS A PAYNE HEAT SYSTEM FOR EVERY BUILDING AND CLIMATE!

A Big Lever to Lift Your Sales Curve

The Johnson Range Burner has been an amazing success. Everywhere, salesmen are finding a wide open market for this new gas appliance. Backed by one of the strongest names in the gas appliance industry, the Johnson Range Burner can be sold with complete confidence. If you are one of the few who haven't caught the enthusiasm of this new sales hit—write today for complete information.



JOHNSON GAS APPLIANCE CO.
Cedar Rapids IOWA

Pacific Coast Representative
C. B. BABCOCK CO.
135 Bluxome St.
San Francisco, Calif.

The Goodman Stopper

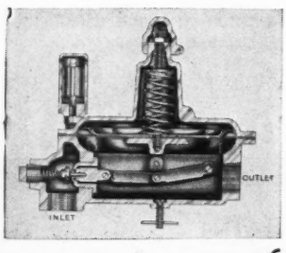
GOODMAN
USED SINCE 1897
2" HANDLE & LOCKING SLEEVE
GAS MAIN STOPPER

The Reliable Shut-off for Street Mains

Equipped with Improved Patented Locking Sleeve, which locks both handles to the pipe. Stopper cannot slip. Gas cannot pass.

Safety Gas Main Stopper Co.
523 Atlantic Avenue, Brooklyn, N. Y.

Pac. Coast Rep.: C. B. Babcock Co.
135 Bluxome Street
San Francisco, California



Reynolds Products—

Products for all kinds of Pressure Reduction—for either artifiicial or natural gas.

GOVERNORS—Intermediate Pressure, Triple Outlet, Holder, Toggle Type Street.

REGULATORS—High Pressure Service, Low Pressure Service, High Pressure Line, Single and Double District Station.

VALVE—Automatic, Quick-Closing Anti-Vacuum, Relief, Cut-off.

REYNOLDS
GAS CONTROL SINCE 1892

Reynolds Gas Regulator Co.
Anderson, Indiana
422 Dwight Building—Kansas City, Missouri
Second Unit Santa Fe Building—Dallas, Texas

New Culver City Office for Southern Counties Gas Co.

Formal opening of the Southern Counties Gas Co.'s recently completed $11,000 Culver City office building, located at 3812 Bagley Avenue, was held on Saturday, March 12. Approximately 500 visitors and friends of

the company attended the opening and were shown through the new structure.

The new building, designed by the company's construction department, is a modern office building, and lighting, ventilation, color scheme, floor and office layout have been scientifically handled.

A feature of the new office is the appliance display floor in the forecourt of the building, shown above.

Dearborn Concentration Hydrometer Is New Product on Market

Dearborn Chemical Co., Chicago, Ill., announces the production of a new device, the Dearborn Concentration Hydrometer, designed for testing boiler water samples for concentration and to reduce the heat lost due to excessive blow-down to a minimum. The boiler water sample may be taken from the water column or from the blow-off connection and should be drawn off through a condenser coil to prevent flashing. The new device has a concentration range from 0 to 1,100 grains per U. S. gallon.

J. A. Davis Takes Post Left By Resignation of G. F. Cotton

J. A. Davis, for several years superintendent for Empire Southern Gas Co., at Big Spring, Texas, has been appointed district manager for Empire Southern Service Co., and Empire Southern Gas Co. in the Big Spring and Brady district. He succeeds Gil F. Cotton, manager for the properties for more than three years. The company serves Big Spring, Brady, Trickham, Rockwood, Lohn, Forson, Whon and Fife from its Big Spring district office.

Santa Maria Gas Co. to Construct 21-Mile Gas Line

Santa Maria Gas Co., Santa Maria, Calif., plans construction of 21 miles of 8-inch line from the north bank of the Santa Maria river to Oilport, above Pismo Beach. At that point the line will connect with the existing line into San Luis Obispo. Approximately $225,000 will be spent on the development.

Joseph Ainsworth Transferred to Cedar Rapids for Ia. Ry. & Light

Joseph Ainsworth has been transferred to the Cedar Rapids office of the Iowa Railway and Light Corp., where he will head the gas development work of the company. He will work particularly on larger industrial applications of gas to restaurants, hotels, and househeating installations, according to John M. Drabelle, engineer for the company.

Macy's control their *Cooking Dollars* with Vulcan

When Macy's, New York's famous department store, erected their new addition they found it desirable to relocate their restaurants and cafeterias.

For these modern cooking departments Macy's again selected Vulcan gas equipment . . . new All-Hot-Top Ranges, Radiant Surface Broilers, Insulated Bake Ovens and Heat Controlled Deep Fat Fryers.

Macy's are careful buyers . . . they buy on performance as well as on price. In cooking equipment they take these factors into consideration . . . possibilities for efficient arrangement (all Vulcan equipment hooks together), ability to produce desired cooking results, speed and ease of operation, easy cleaning, cost of operation and maintenance, quality of material and workmanship, reputation of manufacturer and previous experience.

In the new Vulcan Heavy Duty Line, Macy's found all requirements were met. They could control their cooking dollars . . . getting superior results at low cost.

You can convince any restaurant or hotel management that big savings can be made by replacing old or obsolete equipment with the Vulcan line of gas cooking equipment. Complete data for doing a profitable replacement selling campaign in your locality is available on request. Write now and take advantage of today's most active market.

Vulcan Gas Equipment Sells Easily . . . Gives Better User Satisfaction.

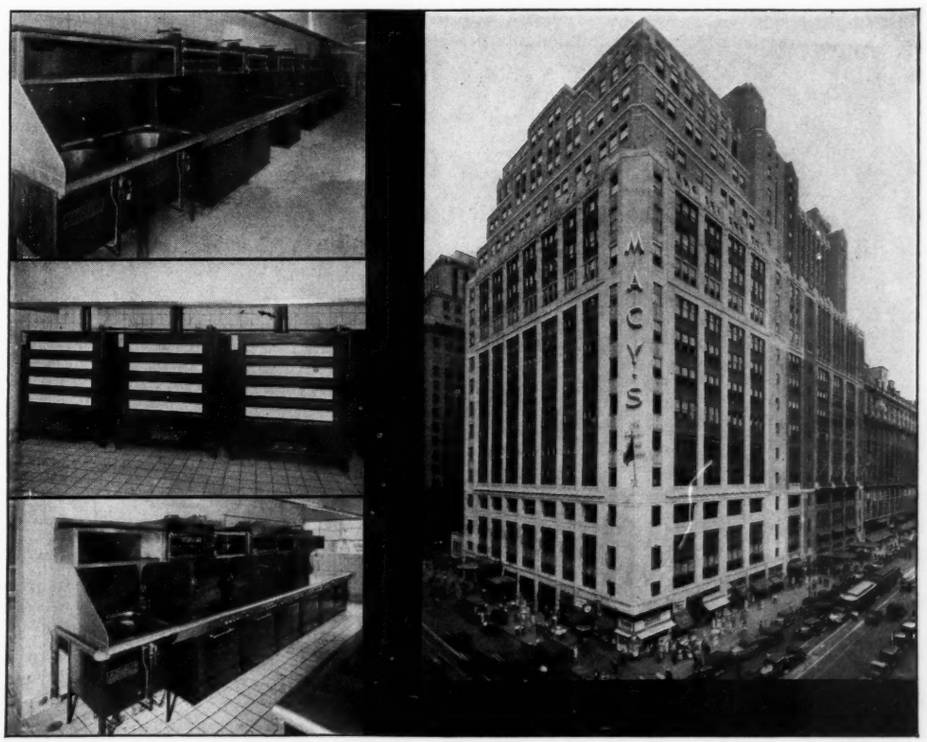
STANDARD GAS EQUIPMENT CORPORATION, 20 EAST 41st STREET, NEW YORK CITY

NEW YORK . BALTIMORE . CHICAGO . BOSTON . BIRMINGHAM . *Pacific Coast Distributor:* Northwest Gas & Elec. Equipment Co., Portland, Ore.

All-Hot-Top Ranges, Broilers and Fryers in 6th Floor Kitchen

Vulcan Insulated Heat Controlled Bake Ovens in Bake Shop

All-Hot-Top Ranges and Fryer in 8th Floor Kitchen



Macy installation by
ARKAY COMPANY
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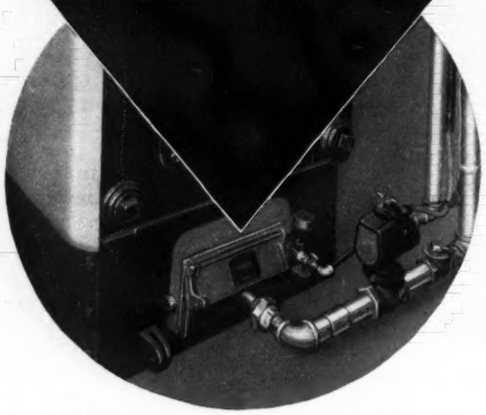
VULCAN

VULCAN EQUIPMENT MAKES GAS THE MODERN EFFICIENCY FUEL . . . CLEAN, FAST AND ECONOMICAL

THERE IS A CECO GAS BURNER
for HOME, BUSINESS BLDG., POWER PLANT, REFINERY and INDUSTRIAL PROCESSES



Gas companies who recommend CECO Gas Burners to their patrons are sure of customer satisfaction . . . for the purchaser of a Ceco has as his guarantee of satisfactory performance the skilled service of combustion experts. Whether it's for heating or industrial use, you'll find a Ceco Burner especially designed to give the most economical, the most dependable operation. Illustrated Bulletins will be sent promptly on request.

COMBUSTION EQUIPMENT COMPANY
GENERAL OFFICE: KANSAS CITY, MO.
WICHITA MEMPHIS LITTLE ROCK HOUSTON

BITGOOD
Multiple Jet Gas Burners
Industrial Furnaces
SAN JOAQUIN BURNERS
Prat Daniel Thermix Stacks and Air Heaters
Bigelow-Liptak Suspended Arches and Walls
North American Burners and Blowers
F. S. BITGOOD, Inc.
Furnace and Combustion Engineers
Los Angeles Portland San Francisco

Gentlemen:
Kindly send me a sample
can and full details regarding
A-B Vit
The New Porcelain Enamel Cleaner
Name.....
Company.....
Address.....
No obligation, of course
Clip and Mail with 10c to cover postage and packing to
A-B STOVE CO., Battle Creek, Mich.

New Rates Proposed by St. Louis County Gas Co.

ST. LOUIS COUNTY GAS CO., Webster Groves, Mo., has filed with the Missouri Public Service Commission a proposed reduction in rates for service of a mixture of natural and manufactured gas.

The new rates provide reductions of 18.4 per cent for domestic gas service; 36.1 per cent for house heating, and 31.7 per cent for industrial use. The proposed introduction of a charge of 53 cents a month for the first 200 cubic feet of gas according to L. H. Egan, president of the company, would result in a small increase for consumers who use only a small amount monthly.

The company has a total of about 40,000 customers, and plans to obtain its supply of natural gas from the Mississippi Industrial Gas Co., which has contracted to purchase gas from the Mississisippi River Fuel Corp., operating a 22-inch pipe line from the Monroe and Richland fields of Louisiana.

The following table shows the proposed schedule of rates for St. Louis County:

First	200 cu. ft. or less	$ .53
First	10,000 cu. ft. per M.c.f.	1.05
Next	20,000 cu. ft.	.95
Next	20,000 cu. ft.	.85
Next	20,000 cu. ft.	.80
Next	20,000 cu. ft.	.75
Over	100,000 cu. ft.	.70

The existing schedule for the service of 570 B.t.u. gas in the county is:

First	10,000 cu. ft. per M.c.f.	$1.05
Next	15,000 cu. ft.	1.00
Next	25,000 cu. ft.	.90
Next	25,000 cu. ft.	.80
Next	25,000 cu. ft.	.70
Over	100,000 cu. ft.	.65

The average monthly consumption of domestic users is 2,950 cubic feet of 570-B t.u. gas, which is the equivalent of 2,100 cubic feet of mixed gas. Annual bills for the house heating customers under the present rates average $389.50, and under the proposed rates they would average $249.00, according to President Egan.

Home Service Activities on Montana Power's Gas System

The home economics department of Montana Power Co.'s Gas Division, under Anna L. Ludden, is carrying on a program of gas appliance education in the high schools of its territory, covering ranges, water heating and house heating. Each subject scheduled for discussion is covered in hour periods, on three separate days. On the first day, gas appliances are explained, on the second a cooking demonstration with a gas range is given. On the third day, a kitchen planning contest is begun, asking each student to draw plans of a modern kitchen. This last feature has engendered much interest and enthusiasm, according to Miss Ludden. The plans are being judged by prominent women in each town, and prizes awarded to the winners.

On completion of a line from Cut Bank to Butte and from Elk Basin to Livingston and Bozeman within the past few months, the company changed over from manufactured to natural gas in its entire system.

Wellsville, Mo., Now Served By Missouri Power & Light Co.

Wellsville, Mo., is now supplied with natural gas from the main line of the Panhandle Eastern Pipe Line Co., through the distribution system of the Missouri Power and Light Co., headquartered at Kansas City. Work on the system was started on January 18 under the supervision of H. D. Meuffels gas engineer and J. H. McClammer, superintendent of construction.

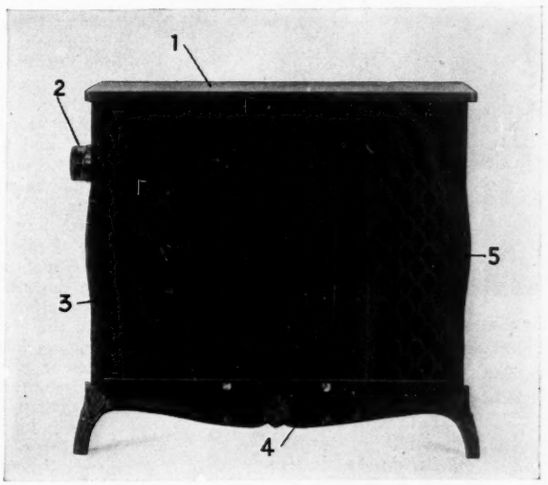
First Call For Fall

Load building is always the result of long range planning The year's sales drives follow each other with startling rapidity. Water heaters,—ranges, then heating is here again.

Whether you plan a summer campaign with attractive terms to keep the sales force busy,—or whether you are saving your punch until Fall—when the weather adds its own sales arguments—this year's plan should include the Humphrey Ambassador.

Humphrey success in the gas industry has been built on long range planning. From the gas arc lamp through the Radiantfire and unit heater, down to the Ambassador, every new Humphrey product has accurately forecast a trend and supplied the merchandise to meet it.

The new Ambassador, a circulating heater that actually ***circulates*** heat through the medium of the small 1650 R. P. M. fan concealed in the unit. With a 20,000 B. t. u. input rating, the Ambassador is 83% efficient when vented. It is both an attractive piece of furniture and an efficient and economical central heating plant.



The essential features of the Ambassador are: 1—Heavy gauge shielded steel cabinet. 2—Thermostat. 3—Room air intake grill. 4—Pilot port. 5—Warm air outlet, fan-forced circulation.

General Gas Light Company
Kalamazoo, Michigan

C. B. Babcock, Pacific Coast Mgr., 135 Bluxome St., San Francisco

McWane-Pacific CAST IRON pipe not only resists rust, it BENDS before it breaks.—Another reason why it is PERMANENT pipe. As small as 1¼, 2, and 3 inches, it is ideal for high-pressure gas.

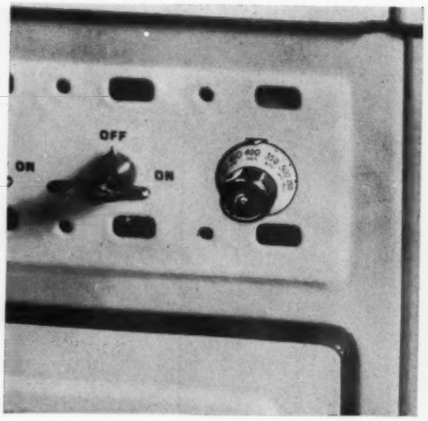
Larger Sizes, too

McWane Pipe comes as large as 12-inches, in 16 foot lengths. Get data.

—and "A Joint for every pressure"

McWANE CAST IRON PIPE CO. BIRMINGHAM ALABAMA

PACIFIC STATES CAST IRON PIPE CO. PROVO, UTAH



Robertshaw Model "F" AutomatiCook is shown on the left as installed on the manifold panel of a range. At right, close-up of the new control.

Model "F" Robertshaw Oven Control

ROBERTSHAW THERMOSTAT CO., Youngwood, Pa., announces its new Model "F" Robertshaw AutomatiCook. The new control is similar in style to a radio dial, and was designed especially for the table-top and console type ranges, installed on the manifold panel, close to the cock handles.

Robertshaw Model "F" is compensated to reduce overshoot and the valve seat is self cleaning and non corrosive and is made with the patented Robertshaw by-pass. The adjustment is conveyed from the "full vision" dial to the valve by means of a rustless and stainless heat resisting flexible shafting.

Making a Rate Change Pay

(Continued from Page 30)

test performance of gas ranges, water heaters and refrigerators as compared with those operated by other fuels. Identical practical meals for a family of four over a period of two weeks were prepared under this scientific supervision on both electric and gas ranges.

These tests furnished a basis for comparative cost charts in the advertising accompanying the reduction. They also furnished the interest value that has enabled the continuation of this new rate advertising almost uninterruptedly since the inception of the campaign. Not only have we been able repeatedly to call the attention of our own customers and all of the rest of the people of Seattle to our reduced rates and at the same time to the economies, speed and convenience of gas service as compared with other fuels, but we have been able to make continuing news of this last rate change of ours.

Inasmuch as our therm rates vary considerably, depending on the amount and kinds of gas equipment used, we were not able to make the reduction automatic. Instead, our customers have had to come into one of our offices or call us on the telephone in order to benefit by the change. The new rates are optional, then, rather than automatic.

We have used this also in our plans to capitalize on the reduction. Our sales department, directed by J. Earl Jones, commercial manager, devised the information sheet which was filled out for every customer calling or coming in to request service under the new rates. Where the customer came in personally, the new contract for service under the therm rates was signed at the time and the sales department information sheet was filled out and passed on to the commercial department. This showed whether the customer was already using automatic hot water service, cooking, house heating or refrigeration and, at the same time, gave the sales department information with which to sell additional equipment, especially if by adding the equipment the customer could benefit by a considerably lower rate for gas service, as was the case, for instance, where a customer added hot water heating to cooking.

In cases where the request for a change to the new rate was made by telephone, the same sales information sheet was filled out, the new contract form was prepared by the accounting department, and a representative of the sales department called and secured the necessary signature at the same time opening the way to a sale or the establishment of a prospect for future business if none was forthcoming immediately.

Naturally, human nature being what it is, all of the Seattle Gas Co.'s domestic customers are not yet signed on the new therm rates. At the time of this writing, however, 5,843 have inquired about the new rates and all but 28 have completed a new contract for service under the therm rate. Inquiries continue to come in at a rate varying from 30 to 50 a day and we are more interested in keeping this steady flow than in any great increase.

Whenever there is any marked tendency for the rate of inquiry to slacken, we turn to a new means of stimulation. Late in December we added a radio program to our advertising and are using a part of its announcement time to increase our customers' curiosity regarding their possible savings. Recently, we have started a series of form letters, sending the first to those customers whose present equipment will entitle them to greatest savings under the new rates. In these letters, we call their attention to the savings they are missing and offer to have our representative call and explain further. Judging by the present

For smart living... this exclusive apartment hotel in the heart of the famous Wilshire District, overlooking beautiful Westlake and Lafayette Parks.

Rates on Application

L. C. Reed, Manager

The Arcady
2619 WILSHIRE BLVD.
LOS ANGELES

Heat Your Water The Automatic Way
It's Simpler, Safer, Quicker—Always Ready
THE VICTORY
The Burner that is Automatically Safe!
Schluckebier Hdw. Co.
Dealers Listed on This Page Handle Appliances Approved by the American Gas Association
Automatic HOT water is not a luxury
Holbrook
$34.00
CRANE
Automatic Hot Water Heater
SOLD ON EASY TERMS
Frank J. Hoirup
DAY and NIGHT Automatic Gas Water Heater
A. F. TOMASINI Hardware Co.
Economy In Operation
Lawson AUTOMATIC WATER HEATER
Lee Hardware Co.
ADD A SHOWER TO YOUR HOME OR AT LEAST MODERNIZE Your BATHROOM!!
Everybody likes a modern bathroom — especially as if served with automatic hot water.
Hot Water
Always, Instantly, Economically
Par-X
NATURAL GAS HEATERS
NIELSEN FURNITURE CO.
143-145 Kentucky Street

PULLING Prospects for Dealers

EACH Pacific Gas and Electric Company gas appliance advertisement is designed to pull prospects for all dealers. But, some dealers receive more prospects from this advertising than other dealers.

And why is this true? Because the prospects created by this advertising must, if the dealer is to benefit, know WHO the dealer is, WHERE he is, and WHAT appliance or appliances he has to offer.

To answer these questions and thus show prospects the way through the least line of resistance, successful dealers are using tie-in advertising.

Each dealer, desiring to increase his number of prospects and sales, prepares or has prepared for him, an advertisement featuring his name, address, appliances, etc. Through the cooperation of local newspapers, the dealer has his advertisement published in space adjoining that used by this Company.

Then, when a prospect sees the P. G. and E. invitation to visit local dealers' stores, his questions, "WHO?"—"WHAT?"—"WHERE?", are answered immediately by the dealer's adjoining advertisement.

Use tie-in advertising to direct prospects to YOUR store.

PACIFIC GAS AND ELECTRIC COMPANY

P·G·and E·

Owned · Operated · Managed
by Californians

WG-204-432

And Now . . . the
HOTEL
STEWART
GOES
MADSEN

NO NOVICE in successful hotel management, The Stewart, long famous among San Francisco hostelries, knew what it wanted when it installed gas-fired equipment throughout to replace its oil-burning apparatus.

For its kitchens, The Stewart specified Madsen gas-fired Cuisine Ranges . . . six fine sections. And Chef Logan, who has served the Hotel Stewart for 25 years, is enthusiastic over the result.

The judgment of men and institutions of this calibre is a safe guide for you to follow in equipping your kitchens. Why not write or phone now for literature?

MADSEN
IRON WORKS, LTD.
P. O. Box 601, Huntington Park, Calif.
(Suburb of Los Angeles)
San Francisco Factory Representative,
Fred R. Sanford, 837 Howard St.
Madsen Hotel & Restaurant Kitchen Equipment Sold by Leading Equipment Dealers.

IT'S NEW
THE BJ
DUPLEX
ORIFICE
FITTING
WITH 2 PLATES
Ask For Folder
BYRON JACKSON CO.
P. O. Box 1307, Arcade Station
LOS ANGELES, CALIF.

trend, there are enough of these as yet unsigned domestic customers to furnish our sales force with constructive leads of this type for several months to come.

It is interesting to note the sales results that have come directly from the new rate offer. A very accurate check has been kept on all sales resulting from any of these therm rate change requests. To date the total dollar volume of sales, the leads for which have come from the rate change directly, is $14,953.41. This consists of a total of 153 separate sales over a period of three months. Seventy-eight of these have been for automatic water heaters, heaters that as far as we know would not have been sold had their purchasers not come in to learn more about the therm rates. In addition, there are now on file in the sales department 1,572 prospects for additional equipment sometime in the near or more distant future, prospects that have devoloped through customer inquiries regarding the therm rates. Some salesman has had a pleasant interview with each of these prospects already, offering her at that time a savings over what she was then paying for gas service. Naturally he has become a pleasant person with whom to deal, one with whom she is looking forward to further dealing as soon as her budget will allow. Not only have the new rates developed a prospect but they have lifted the Seattle Gas Co. salesman out of the welter of doorbell punchers who assail her daily.

It is not too soon to say that we have succeeded in accomplishing two of our objectives in the introduction of the new rates. The public at large, builders, plumbers, real estate men, all have been reached with the story of our new rates, both in the newspapers, on the radio, on the outdoor boards and in groups with our executives and sales force. Every day we see evidences that persons who never before thought of gas service as a factor in Seattle home life are now thinking of it very seriously.

Our merchandise sales have been stimulated noticeably. In automatic water heating alone for example, since the new rates were introduced November 11 we have sold 254 automatic storage water heaters. During the preceding 10 months of 1931 we sold only 230. A lesser but real stimulation has been felt in other merchandise sales fields.

It is early yet to say whether we will accomplish our third objective, an increased consumption of gas sufficient to effset the revenue loss occasioned by the cut in rates. An indication is afforded by the January revenue from domestic gas service sales which was about $8,000 less than January, 1931, but which showed an increase in gas sales of 2,000,000 cubic feet.

We are still talking about our new rates, still find the public interested in them and are still increasing gas and merchandise business actively as a result of this reduction. We believe this is unusual three months after the reduction has gone into effect. Even more important, however, is the interesting fact that as far as we can see, we are a long way from reaching the end of the rate change's effectiveness. Probably it will be working for us, actively and hard throughout the remainder of 1932, a peg on which to hang numerous aggressive sales and advertising activities; in short, a rate reduction that is being decidedly made to pay.

Beauty Appeal in Gas Range Sales

By J. E. LEONARD
Engineer and Designer, Hammer-Bray Co., Ltd.

IN the past two years, a considerable change has made itself apparent in the design and merchandising of gas ranges. The relation between the designing and selling departments has reached the point at which a clear understanding on each side is absolutely necessary. To the end that every possible selling appeal may be fully exploited by the retail selling and advertising departments, an important inter-relation has grown up between designing and merchandising.

J. E. Leonard

It would be conservative to estimate that during this period over one million dollars has been spent by stove manufacturers for engineering and designing work, and never before has there been such a rapid advance in this phase of the industry. The purpose of these expenditures has been the promotion of gas range sales by placing the business on a new level, creating new selling appeals resulting in increased sales.

The result of these efforts has been a vast improvement in the design of gas ranges, until today it is necessary to produce a gas range that is more than just mechanically correct. To make it cook and bake well only, with the minimum amount of fuel, and with conveniences that save work and time for the housewife, is not sufficient. The modern gas range must not only possess all these qualities, together with attractive appearance, but it must now possess another feature—a true artistic quality of beauty.

Both designers and merchandisers now realize that gas ranges must be regarded in the same class with other home furnishings. The consequence is that sales now depend not only on mere utility, but on beauty of design that can be made to appeal to the housewife. Just as living room furniture is selected for its beauty and harmony with the home atmosphere, so is the kitchen range chosen with this same thought in mind.

Despite the marked advance that has been made in the design of ranges that will appeal to purchasers from this standpoint of beauty of construction, line and decoration, its importance has thus far been neglected in merchandising. There is a distinct demand for charm in kitchen furnishings as well as in the rest of the home, and this feature must receive its due attention in selling the appliance. Nor is it sufficient merely to say to the prospect, "this is a beautiful range," and then launch into a dry discourse regarding its mechanical construction. The beauty appeal of a gas range, if developed, has more sales potentialities than that. Steps are now being taken to adapt selling and advertising methods to the new designs. The old method of stove selling, based purely on mechanical features of construction, must give way to the new sales talk built around the beauty appeal as well, if all sales advantages are to be realized.

The prospective purchaser is capable of being greatly impressed by the appearance of the stove, and there is thus an opportunity for an interpretation of design. A very appealing story can be woven about the range, indicating how each line, curve, bevel and

COASTWIDE ADVERTISING

That helps every Gas equipment manufacturer and dealer

The Co-operative Industrial Gas Advertising Program—financed entirely by the utilities of the Pacific Coast—is now in its third consecutive year. Monthly advertisements; technical news service:

Covering 12 important industries

Bakeries . . Laundries . . Confectioners . . Dry Cleaners . Dairies . . Machine Shops . . . . Factories . . . . Appliance Dealers . . . . Architects . . . . Building Trades . . Plumbing and Heating . . . Hotels . . . Restaurants . Caterers

. . . using 20 leading Western Trade Magazines

with a total circulation of nearly 80,000—which means a potential audience every month of more than 237,000 readers. And for the 12 months of 1932, a total of more than 2,850,000 reader-impressions!

The theme of this campaign ("Helping Solve the Problems of 1932") is keyed to present business conditions . . . Each advertisement shows graphically and convincingly how modern gas-fired equipment reduces fuel bills, increases labor efficiency, and improves production and finished products. Each advertisement paves the way to new sales of modern gas equipment and appliances. The entire industry benefits! PACIFIC COAST GAS ASSOCIATION *(of which your gas company is a member)* 447 Sutter St., San Francisco, Calif.

Electrogas Floor Furnaces—5 A.G.A. approved models—to meet all requirements

Electrogas

FLOOR FURNACE

"It's Matchless"

NOW—more than ever before, Quick, Economical Heat is in demand wherever Natural Gas is available. 1932 will be profitable for those who are ready to meet this demand.

[Write us—right now—for details of our new cooperative selling plan.]

Electrogas Furnace Co., 466 Sutter St., San Francisco

Proven economy and Efficiency through ten years of service

Fraser Furnaces

Floor Furnaces
Wall Furnaces
Console Heaters

A complete line of Quality Equipment

20 different models all A.G.A. approved

Write for prices and additional information

Manufactured by

Fraser Furnace Company

Stockton, Calif.

Distributed by

H. R. BASFORD CO. San Francisco Los Angeles

SUBSTANTIAL REDUCTION ON VENTED CLOW GASTEAM RADIATORS

WRITE for NEW PRICES

JAMES B. CLOW & SONS
201-299 N. Talman Avenue, Chicago

The Semet-Solvay Engineering Corporation invites your inquiries for

Equipment for the manufacture, cleaning and handling of gas.
Equipment for the recovery and treatment of coal by-products.
Welded steel products, piping and valves.
Producer gas and blue gas apparatus.
Engineering service, investigations and reports.

Semet-Solvay Engineering Corporation

40 Rector St. New York, N. Y.

color has been developed to produce a harmonious combination.

Advertising and direct selling will be more effective if this thought is borne in mind. Prospects like to have the harmonious appearance suggested to them, as well as the many features of convenience and construction. Artistic appeal in sales efforts relegates price consideration to secondary position, and touches a very responsive chord in every home owner—the desire to own an appliance that not only is useful, but pleasing to the eye and harmonious with domestic surroundings.

Classified Advertising

Classified advertising five cents per word; minimum $2.00 per insertion. Situation Wanted advertisements up to 50 words will be published three consecutive issues without charge. Small professional cards 1-in. deep by 21 ems wide are $5.00 monthly on 12-time contract.

SITUATIONS WANTED—MALE

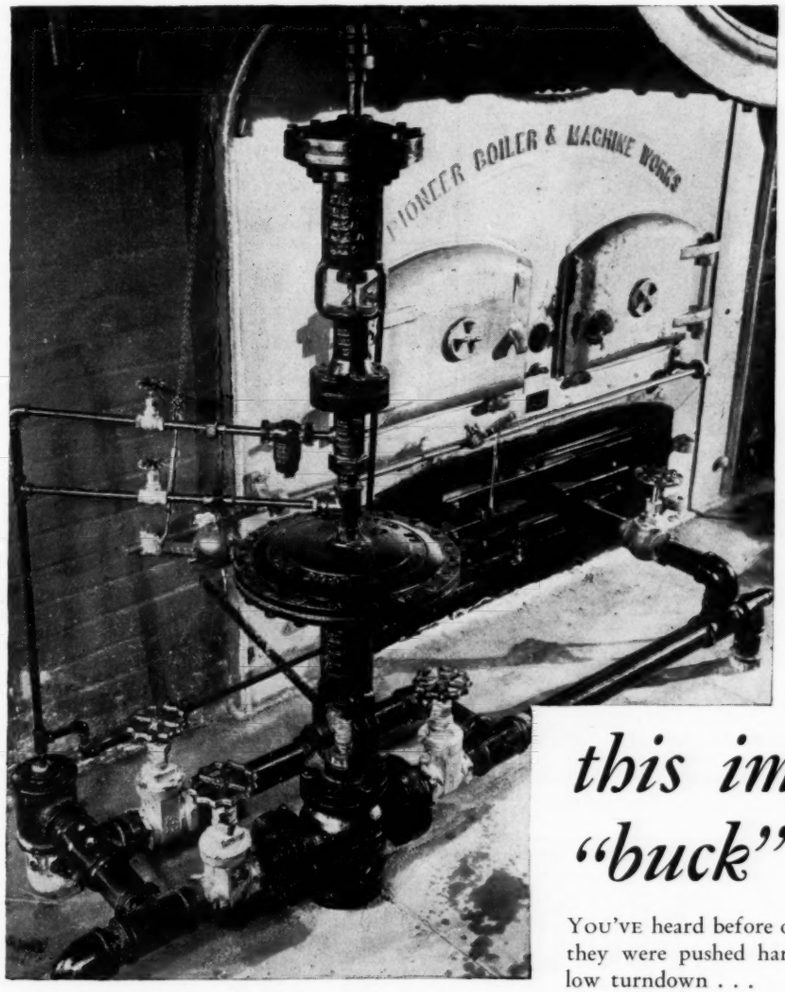
Executive, experienced in all phases of public utility operation and management, especially electric and natural gas, desires position. Applicant is capable of assuming responsibility for operation of a property, and has been particularly successful with public relations and merchandising. Will locate anywhere. Available immediately. Unquestionable references furnished. Address Box E-179, *Western Gas,* 124 West Fourth Street, Los Angeles, Calif.

Heating engineer, age 38, with 23 years experience in the natural gas industry, desires position with active company. Applicant is capable of managing series of small town properties. Has had experience as manager, sales manager, and chief heating engineer with large companies. Address Box E-181, *Western Gas,* 124 West Fourth Street, Los Angeles, Calif.

Woman secretary desires position. 12 years experience in public utility commercial department and gas appliance wholesale organization. Complete knowledge of secretarial duties and office management. Address Box E-183, *Western Gas,* 124 West Fourth Street, Los Angeles, Calif.

Executive type of man, now employed, with large personal acquaintance with leading utilities and dealers of the West, desires to make change. Experience includes conducting of sales classes, cooking schools and merchandise sales. Can furnish highest type business, personal and financial references. Address Box E-185, *Western Gas,* 124 West Fourth Street, Los Angeles, Calif.

Single man, age 27, experienced in house heating and industrial conversion work, also operation and maintenance of high and low pressure systems, wants position. Past four



N. G. E. Gas Burner Type T and Wilgus-N. G. E. Precision Pilot Automatic Gas Fuel and Draft Control installed in the 100 h.p. H. R. T. boiler at the plant of Cornelius Bros. Ltd., meat packers, Los Angeles.

Go on... try to make this improved burner "buck" or burn back!

YOU'VE heard before of burners that positively would not buck when they were pushed hard . . . nor burn back in the mixing tube at low turndown . . .

Here's one that delivers!

The new N. G. E. Type T burner has been quietly developed for months . . . with the idea of improving on any burner we or anybody else ever built before. It has plenty of other points you won't want to overlook when you're figuring a job that just *has* to be right . . . among them:

The advantages of Venturi tube injection and multiple-jet intimate mixture effectively *combined*.

Complete separation of primary and secondary air supply, with automatic louvre door control.

Supplied as an efficient combination oil and gas unit when required. Burner orifices adjustable without taking spuds out of burner.

Burner housing installed flush with boiler front, and pilot light built integral with burner.

Sounds like taking in a lot of territory? Maybe . . . but send the coupon or call nearest office and get the rest of the story. No telling when you'll need some extra performance to close a tough job!

Wilgus-N. G. E. Gas Fuel and Pressure Regulators • N. G. E. Liquid Level Controllers • N. G. E. Gas Burners • Webster Radiant Gas Burners • Surface Combustion Industrial Furnaces • Janitrol House Heating Machines.

NATURAL GAS EQUIPMENT INC.
714 West Tenth Street, Los Angeles.
Please send data sheets on Type T burners with your compliments.

NAME_____

COMPANY_____

ADDRESS_____

NATURAL GAS EQUIPMENT INC.

LOS ANGELES . . . . . PETROLEUM SECURITIES BUILDING
SAN FRANCISCO . . . . . 1123 HARRISON STREET
BUTTE, MONTANA . . . . . HEATING ASSURANCE INC.

Western Distributors for SURFACE COMBUSTION COMPANY ◆ WEBSTER ENGINEERING COMPANY

"Antileke"

The hypo-sealed pipe joint saves 20% to 50% in the repairing of any ordinary or difficult gas leak on cast iron or steel pipe.

Thousands in use without a single failure.

GAS & ELECTRIC FACILITIES, LTD.
447 Sutter St., San Francisco

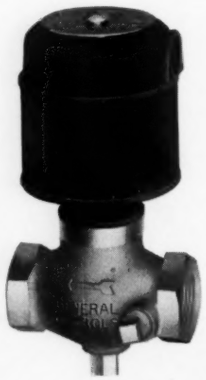
Send literature and prices on "Antileke"

Name.....

Address.....

City.....State.....

IMPOSSIBLE?



It is "impossible" to make an absolutely noiseless A.C. valve, but General Controls is making one!—The General Controls Magnetic Gas Valve.

✦

GENERAL CONTROLS CO., Ltd.
1539 Folson St., San Francisco

Jensen Instrument Company
Los Angeles Distributors

The PARK WILSHIRE
HOTEL APARTMENTS

Most desirably situated on Wilshire Boulevard, adjoining beautiful Westlake Park---15 minutes from the city center. By bus directly in front of the building and by three car lines within one block.

•

Apartments from $75 a Month
Also Daily and Weekly Rates

•

2424 Wilshire Blvd., at Westlake Park

•

Modern, Home-like and
Supremely Comfortable

LOS ANGELES

years with the Gas Service Co., Kansas City, Mo. Desires to make connection with another company; will go any place; can furnish good references. Address Box E-187, *Western Gas,* 124 West Fourth Street, Los Angeles, Calif.

Young man, 25 years of age, with more than three years experience in house heating with natural gas, desires position. Applicant has had college education, and is familiar with installation and adjustment of all types of conversion burners, gas fired boilers and furnaces. Is capable of estimating heating requirements and can handle design of installations. Some experience with industrial boiler conversion of 100 h.p. and less. Address Box E-189, *Western Gas,* 124 West Fourth Street, Los Angeles, Calif.

General manager of natural gas distributing company, having exceptional experience in building industrial load in new territory, desires to make change. Graduate engineer and previous knowledge of manufactured gas operations and several years of selling gas plant equipment. Address Box E-191, *Western Gas,* 124 West Fourth Street, Los Angeles, Calif.

Engineering graduate, experienced in design, testing and construction of butane gas plants and general engineering practice, desires position. Address Box E-193, *Western Gas,* 124 West Fourth St., Los Angeles, Calif.

Gas measurement engineer and accountant seeks position. Broad experience in both office and field with orifice meters, computation of charts, and accounting records for gas and natural gasoline. Familiar with charcoal testing, gasoline distillation, and other laboratory work connected with absorption plants and gas measurement. Age 31. Will go anywhere. Address Box E-195, *Western Gas,* 124 West Fourth Street, Los Angeles, Calif.

Service man, aged 35, with five years experience in manufactured, natural and butane gases, desires position. Applicant is experienced in welding and in installing mains and services. Will go anywhere. Address Box E-197 *Western Gas,* 124 West Fourth Street, Los Angeles, Calif.

Expert meter repairman, shop supervisor with meter maintenance experience desires position. Has had eight years experience repairing and testing ironcase dry gas meters. Has also had experience in regulator repair and meter installation. Applicant prefers to locate in east or south but will consider any location. Good references. Address Box E-199, *Western Gas,* 124 West Fourth Street, Los Angeles, Calif.

Estancia Valley Carbon Dioxide Development Co. to Build Plant

The Estancia Valley Carbon Dioxide Development Co., Albuquerque, N. M., is planning to construct a plant for the manufacture of carbon dioxide ice to be located near the Santa Fe R. R. right-of-way not far from the Wilcox Dome in central New Mexico. The plant will be of 15-ton capacity, a pipe line taking the gas from the wells to the plant.

An easy seller because of its capacity and heavy-duty service

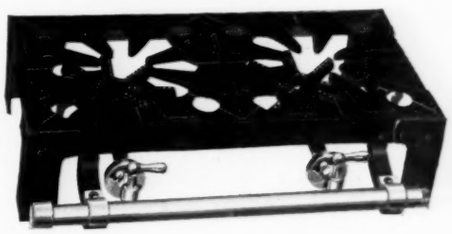
WEDGEWOOD
GAS RANGES

This all-around restaurant gas range provides ample cooking-top space for four 15-inch stock pots.

Equipped with four extra large 8-inch super-giant burners and extra heavy removable grates. Large size oven 22-in. wide and 24½-in. deep.

Heavy-Duty Gas Plates

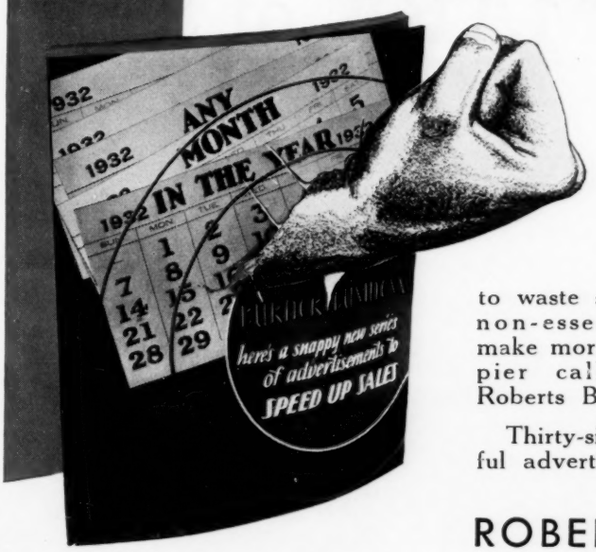
Hotel type with extra large 8-in. super-giant burners.



JAMES GRAHAM MFG. CO.
Largest Stove Manufacturers in the West
A Pioneer That Is Still the Leader
San Francisco, Newark, Calif., Los Angeles

Chefs Prefer Wedgewood Equipment Because It Gives Dependable Service

Put the PUNCH back of your sales efforts with NEW ROBERTS GORDON Advertising!

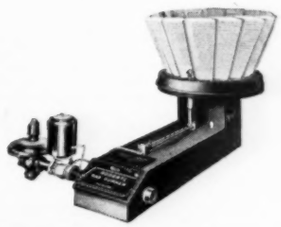


Prepare the way for your salesmen with a barrage of this new series of Roberts-Gordon sales helps . . . Your men won't have to waste so much time on non-essentials. They will make more calls . . . snappier calls. Sell more Roberts Burners.

Thirty-six pieces of colorful advertising—folders, illustrated letters, envelope stuffers, newspaper ads in a variety of sizes and styles, a new comic strip series, and a window poster printed in eight colors.

Use this material freely and your salesmen will spend less time explaining—and more time selling. Write for the Roberts-Gordon advertising campaign for 1932.

ROBERTS Controlled
Gas Heating Unit

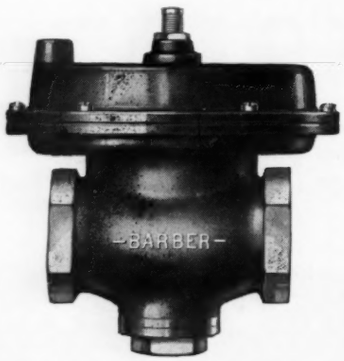


ROBERTS-GORDON
APPLIANCE CORPORATION
CURTISS BLDG. BUFFALO, N. Y.

Trade Mark

BARBER GAS PRESSURE REGULATORS

A TRULY SUPERIOR PRODUCT IN APPEARANCE AND PERFORMANCE



Illustrating the two-inch size. All sizes from one-quarter inch to two inches inclusive have the same neat, compact appearance.

If you attempt to pour two gallons of water in a one gallon container, you will waste one-half of the water.

Exactly the same logic applies in the burning of gas. All high grade gas burning appliances, and in particular those approved by the American Gas Association Testing Laboratory, are carefully designed, tested and rated to burn efficiently a certain amount of gas per hour upon a definite pressure (usually 3½ in. water column pressure).

For example, if an appliance is rated to burn a maximum of 30 cu. ft. of gas per hour on a 3½ in. pressure, and the pressure is increased to 8½ inches, the amount of gas passed to the burner on the increased pressure will be approximately 60 cu. ft. per hour, which will result in a possible waste of one-half of the gas or even more. But more serious is the danger to life from unburned gases (carbon monoxide).

BARBER GAS PRESSURE REGULATORS will eliminate this WASTE and DANGER.

MANUFACTURERS AND GAS COMPANIES—Protect the merit of your product—Maintain the merit of Gas Fuel—by using BARBER GAS PRESSURE REGULATORS.

THE BARBER GAS BURNER CO.

3702-04 SUPERIOR AVE. **CLEVELAND, OHIO**

C-F *is the MARK of Sure Regulation*

THIS installation of a Chaplin-Fulton Low Pressure Regulator represents modern practice in safety regulation of natural gas—everywhere.

C-F Regulators of more than forty types are widely used where safety is considered quite important, and dependable operation is demanded.

Extra sensitive in response to the variations in flow, they are strong, well designed and have all the characteristics that superior workmanship has been able to create during the experience of the oldest gas regulator manufacturing organization.

Every type of C-F gas regulator is fully illustrated and described in our Catalogue and Bulletins. Present your service problem and we'll send you the correct Regulation solution.

The Chaplin-Fulton Mfg. Co.

28-40 Penn Ave., Pittsburgh, Pa.

DIRECTORY

Byllesby Engineering and Management Corporation

Wholly-owned subsidiary of Standard Gas and Electric Company

231 South La Salle Street, Chicago
New York Pittsburgh San Francisco

MACCO - ROBERTSON
LIMITED
Pipe Line Construction
ORGANIZATION — EXPERIENCE
RESPONSIBILITY
LOS ANGELES CALIFORNIA

GAS PIPE LINE MAP
Compiled by the Editors of WESTERN GAS—Size 45" x 45"
The most comprehensive published; covers the 22 western states in detail. Gives gas fields, names of natural gas communities; sizes of pipe lines and names of pipe line companies.
Prices: $1.50, Heavy Bond Paper; Printed on Cloth, $3.50
WESTERN GAS
124 West Fourth St. Los Angeles, Calif.

If you would keep in touch with the Natural Gas and Butane industries, send a check for $2.00 to

WESTERN GAS
124 West Fourth Street, Los Angeles

Name.....

Company.....

Position Occupied.....

Street Address.....

City and State.....

Subscription Rates: 1 Year $2.00; 3 years $5.00;
Foreign $3.00 per year

SPRAGUE
SEMI-CHROME
LEATHER

Resists acids
and boiling water.

Now Used in All

SPRAGUE METERS
AND REGULATORS

May we send you
samples and data?

The Sprague Meter Co.
BRIDGEPORT, CONN.
Los Angeles, Calif., San Francisco, Calif.
Newark, Ohio
Davenport, Iowa Houston, Texas

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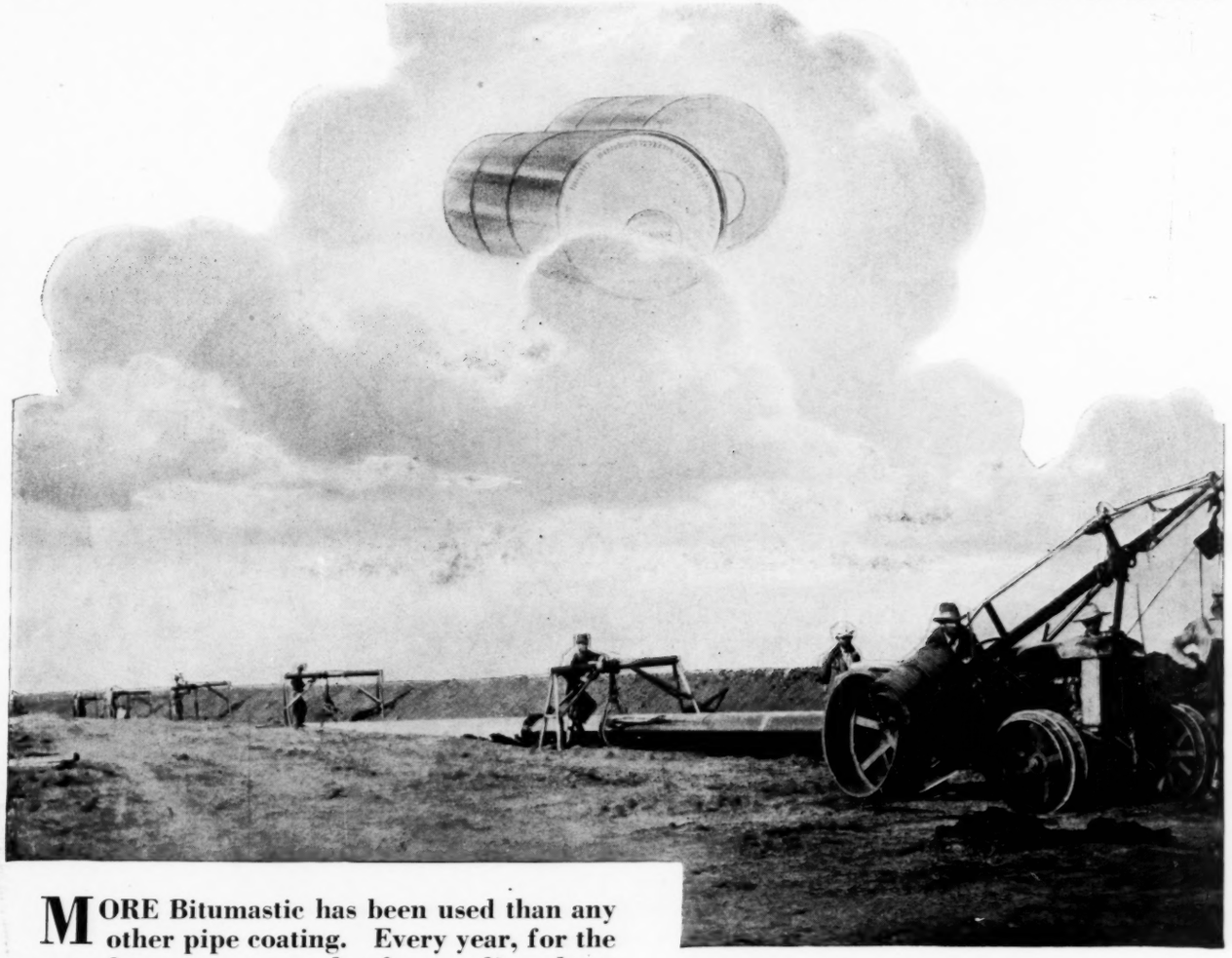

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